THE UNIVERSAL HOME DOCTOR

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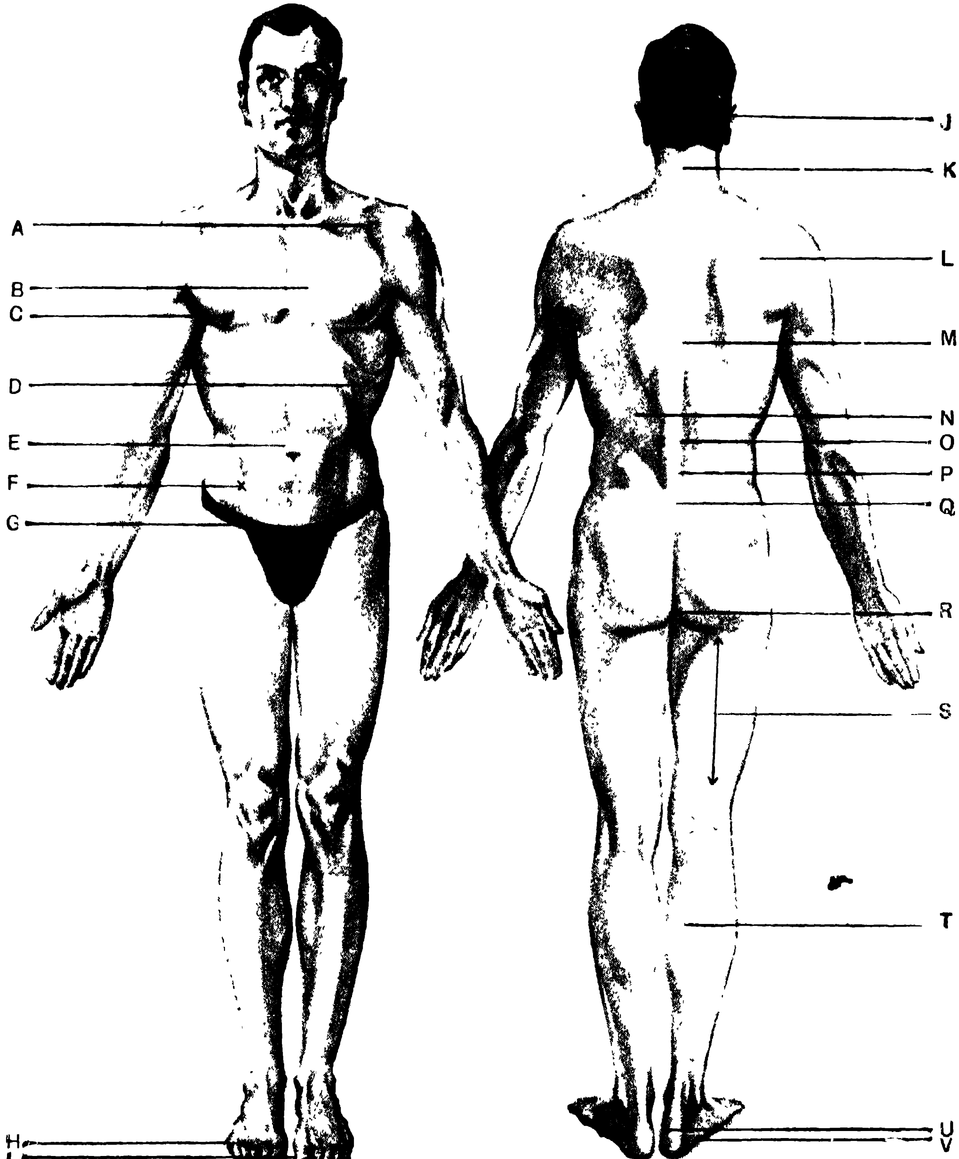
UNIVERSAL HOME DOCTOR

ILLUSTRATED

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DIAGNOSIS DIAGRAM: THE MALE ANATOMY

Letters indicate the centre of the areas where warning pains may occur.

A Rheumatism, neuritis, neuralgia, dyspepsia, pleur
B Anaemia, heart disorders, angina pectoris, dyspep
C Pleurisy, pneumonia, muscular rheumatism, sh pericarditis, phthisis, aneurism (left side only), dyspepsia (left side only)
D Dyspepsia, gastric ulcer, acute gastritis, enlarged spleen colitis, floating kidney, renal colic
E Appendicitis (early stages), colic, peritonitis, gastro-enteritis, obstruction of bowels, spinal disease
F Appendicitis (later stages) *McBurney's Point*
G Renal colic, hernia, varicocele, bubo
H Corns, neuralgia I Bunion, gout
J Neurasthenia, eye strain, meningitis, rheumatism
K Meningitis, spinal disease

s, liver disease (right side only), rheumatism, of stomach (right side only), neuritis, neuralgia
M Dyspep gastric ulcer, spinal disease, rheumatism
N Affectio of spleen
O Constip ion, gastric ulcer (often specially tender at xi)

kidney disease, influenza

of bladder, prostate, testicles, piles, disease sciatica
R Piles, an fistula or fissure, ischio-rectal abscess, coccygeal neur gia, pruritus ani

ffections of rectum
lebitis, varicose veins
vitis, neurasthenia V Neuralgia, flat foot

See *also* Diagnosis Diagram: The Female Anatomy, p. 619

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INTRODUCTION

THIS book is a contribution to the health and well-being of the nation. It has been planned and written with the all-important object in view of making known to the public the principles of health and good living. For until we have acquired a proper understanding of the human body and its functions, and are all able to base our mode of living on the recognized rules of health and hygiene, we cannot hope to be an A1 nation.

The purpose of this book is a practical one. By consulting it readers will be able to recognize and understand warning symptoms and summon medical assistance in good time, where ignorance might cause delay and aggravate the complaint. To apply correctly these general facts to each individual case, medical training is, of course, necessary; and the importance of the doctor's personal diagnosis and skilled treatment of disease cannot be too much emphasized.

Moreover, medical research has made such strides in the last ten years that the possession of a really up-to-date book of medical knowledge is essential to every home. Treatments given only a few years ago have been superseded to-day by directly opposite methods, and scientific research is continually making new discoveries that show former knowledge to be insufficient and misleading.

It will be found that in these pages is incorporated the latest possible information on new medical discoveries and developments. This has only been made possible by the co-operation of many leading specialists in the fields of practice and research, who have contributed to this work. Thus many new facts are included, which have not yet had time to find their way into the standard medical textbooks.*

To assist the reader and to ensure immediate and accurate reference, this volume has been arranged alphabetically, with cross-references to other subjects associated with each entry. It describes in a simple way modern

* See under the following sections: Anæsthetics, Chorea, Diabetes, Diet, Dyspepsia, Electrical Treatment, Endocrine or Ductless Glands, Ketogenic Diet (Kidney Infections), Malaria, Nephritis (Bright's Disease), Nervous Diseases, Pernicious Anæmia, Pneumonia, Rheumatism, Vitamins, etc.

methods of the treatment of disease, and shows how the comfort of the sick may be increased, whether by nursing or the correct preparation of invalid diet. The latest developments and tendencies of medical research, both in the laboratory and at the patient's bedside, have been included, in order that this general knowledge may be of help both to the patient and the doctor when treatment is being undergone.

Further, this volume tells one what to do and how to do it in a case of accident, or poisoning, or other emergency. It gives full instructions about the measures to be taken in serious illness until the arrival of the doctor. The subject of sex is dealt with in a sane and practical way. At the end of the book is placed for the convenience of readers a series of supplements that have been specially written by leading authorities, on such subjects as Child Welfare, First Aid, Diet and Invalid Cookery, Beauty Culture, etc. These supplements have been selected both from the point of view of their utility and of their interest to every thinking man and woman. In addition this volume contains countless facts on common ailments and obscure diseases; the structure and functions of the various organs; hospitals and spas; sanitation and ventilation; medicinal plants and their uses; X-rays and radium; artificial sunlight and massage; and nearly 2,500 other subjects.

It is hoped that this work will not only prove of great practical value and interest in times of sickness, but will also serve as a helpful guide to the best ways of maintaining the health of the individual and the home. To know all about the human body and its functions is a duty that we owe ourselves. In understanding the rules of hygiene and in applying them to our daily conduct and environment, we automatically raise our standard of living and make definite progress in stamping out disease. Prevention is always better than cure, and it is a matter of supreme importance to us to be able to turn our attention from disease and to concentrate it instead on the creation of sound and lasting health.

THE EDITOR

The UNIVERSAL HOME DOCTOR *Illustrated*

A.B.C. LINIMENT.—A liniment or rubbing mixture made up of equal parts of the drugs aconite, belladonna and chloroform. It is very good for relieving pain caused by lumbago, sciatica, neuralgia, rheumatism, stiffness after exercise, etc. The mixture should be painted over or rubbed gently into the skin. Do not use too much of the liniment or rub too hard, especially if the skin becomes tender.

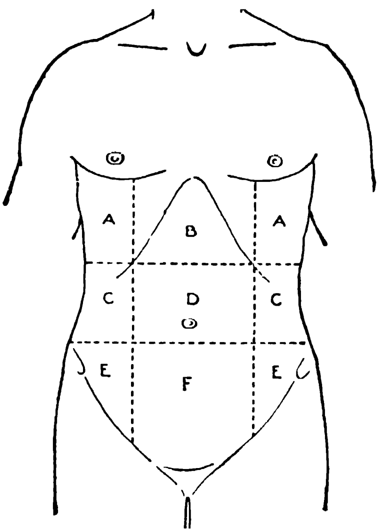
ABDOMEN.—The abdomen is the main part of the trunk of the body and consists of a large cavity containing the various abdominal organs. It is popularly known as the belly or stomach, but the stomach proper is merely one of the organs contained in the abdomen. The structure surrounding the abdomen is largely muscular, so that the abdomen can contract or expand easily in any direction, and thus it varies in size and shape with the changes in the organs contained in it. This power of altering at need is a great help in discovering the state of the various organs contained in the abdomen, which are liable to swell when diseased. The abdomen begins just below the chest or thorax, and is separated from it by a wall composed of muscle and tendons which is called the diaphragm and which stretches right across the body. If the diaphragm is considered as the roof of the abdomen, the floor will be the bony basin, called the pelvis, which lies between the two hip bones, and contains the bladder, part of the colon or large intestine, the rectum and most of the generative organs. The abdomen is attached to and supported at the back by the lower ribs and spine, and in front is bounded by a wall of muscle.

The blood supply of the abdomen is conveyed from the heart by the great artery known as the *abdominal aorta* and its branches. In the centre of the abdomen, behind the stomach, is found a very important nerve centre called the *solar plexus.* A blow on the solar plexus, such as often occurs in boxing, gives rise to the sudden collapse which is known as being "winded."

ABDOMEN, CONTENTS OF.—The organs or *viscera* which lie in the abdomen are contained in a cavity which is lined by a smooth membrane called the *peritoneum.* This membrane is attached to the wall of the abdomen on its outer side, and on its inner side stretches over the organs beneath it. It is lubricated by a small amount of *serous fluid* and thus the organs are protected from friction with the peritoneum and each other.

The organs contained in the abdomen are described from the diaphragm downwards: The *liver* is to the right and is situated mostly under the right ribs, but it also extends partly across the body and under the left ribs. Underneath the liver is the *gall-bladder*, which is a small bag in which the bile or juice produced by the liver is stored and concentrated before it is poured into the duodenum. In front of the liver and to the middle and left of the abdomen lies the *stomach*, which joins, on the right side of the body, on to the duodenum. Below the stomach and to the left of it is the *spleen*, and a long body called the *pancreas* (called sweetbread in animals), which lies behind the stomach between the spleen and the duodenum. In front of the liver and below it, but behind and below the stomach, are the *kidneys*, one on the right and one on the left of the abdomen. Attached to them above are the *suprarenal glands* or *adrenals.*

The rest of the abdomen proper is taken up with the coils of the small bowel or *intestine*, and the *large intestine* which is divided into the *cæcum* and *appendix* and the ascending,



Abdomen, Divisions of
A. Hypochondriac; B. Epigastric; C. Lumbra; D. Umbilical; E. Iliac; F. Hypogastric Regions.

transverse and descending *colon*. The whole of this *intestinal tract* is popularly known as the bowels. In the pelvis or lower part of the abdomen are the *bladder*, which acts as a reservoir for the urine until it is ready to be voided, part of the colon, the whole of the *rectum*, which is the lower end of the intestinal tract, and most of the organs of reproduction.

ABDOMEN, REGIONS OF.—For greater ease in describing the abdomen it is usual to divide it into regions. The area round the umbilicus or navel is called the *umbilical region*. Directly above it is the *epigastric region* or epigastrium, and below it the *hypogastric region*. To the right and left of the epigastrium are the *right* and *left hypochondriac regions*. At the sides of the umbilical region are the *right* and *left lumbar regions*, and below them the *right* and *left iliac regions*.

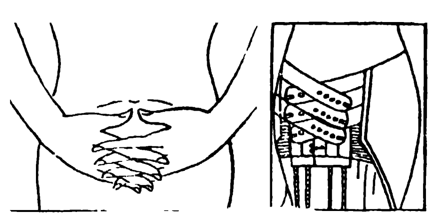
ABDOMEN, WALL OF.—The abdominal wall consists chiefly of muscle and fat, and has the property of being very elastic, as may be seen from the way it is stretched by pregnancy or severe abdominal distension, and yet can regain its former size when the strain is relaxed. This elasticity of the abdominal wall is an important feature in maintaining health, since by means of it the contents of the abdomen may vary in bulk, as they do from hour to hour all the time, without inconvenience. If the elasticity is lost through ill-health or neglect or overgrowth of fat, great discomfort may arise. It is important therefore to keep the muscles in tone through exercise. The abdominal wall has a number of weak spots in it, and in the course of violent exertion, or for some other cause, one or other of the organs contained in the abdominal cavity may break through one of these weak spots, thus causing the condition known as hernia.

ABDOMINAL BELT.—In cases where the abdominal muscles have become slack, it may be necessary to give them support by means of an abdominal belt. During pregnancy, or after labour, a special maternity belt may be worn if necessary, which gives support without too much pressure. After certain abdominal operations the muscles are weakened and may require support until their natural elasticity returns. In some cases, such as dropped kidney or hernia, further reinforcement may be given by means of an extra pad fixed to the inside of the belt. (*See also* CORSETS.)

ABDOMINAL EXERCISES.—*See* EXERCISES; REMEDIAL EXERCISES.

ABDOMINAL INJURIES.—*See* FIRST AID SUPPLEMENT.

ABDOMINAL TUMOURS IN WOMEN.—Tumours of one sort or another are fairly



Binder Abdominal Belt
Diagram on left indicates what the belt should do, i.e., support the abdomen. Diagram on right shows belt in position.

common in women. They can be present at all ages and whether the woman is married or single. In a great many cases they are either cystic tumours of the ovary, which are commonly called ovarian cysts, or they are solid fibroid tumours of the womb, known as



THE ABDOMEN

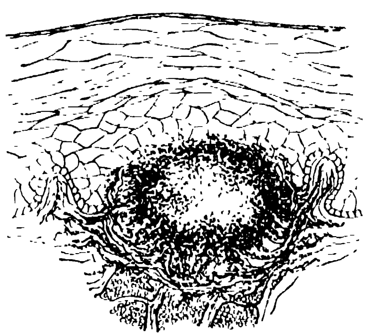
A. Liver.
B. Gall Bladder.
C. Stomach.
D. Omentum covering the Intestines.
E. Colon (Large Intestine).
F. Small Intestine.
G Cæcum.
H Appendix.
I. Urinary Bladder.

fibroids. These tumours may remain small and be quite harmless, but sometimes they grow to an enormous size and cause trouble by pressing on the surrounding organs. There is also the possibility that they may turn malignant, which in fact means turn into cancer. It is safer, therefore, to have such tumours removed. (*See also* FIBROIDS; FLOODING.)

ABDUCTOR.—Abductor is the term applied to various muscles which move the structures to which they are attached in a direction away from the middle line of the body.

ABORTION.—When the contents of the womb are lost prematurely during the first three months of pregnancy, this is called abortion. The word miscarriage is usually applied when this explusion takes place between the fourth and seventh months, and after the seventh month, the term premature delivery is used. Abortion seems to take place during the first three months more frequently than at any other time. During the first month or two of pregnancy, abortion may in some cases pass undetected, as it usually occurs at the time the menstrual period is expected. The causes of abortion or miscarriage are various. It may be due to disorders affecting the father, the mother, or the child. In some cases, the advanced age of the paternal parent, poor health, or poisoning, such as chronic alcoholism, may be the cause. Syphilis or tuberculosis are two very important factors, especially if both parents suffer from either condition. Displacements of the womb or tumours of the womb are also among the most common causes. Other causes are acute fevers and certain conditions such as heart or kidney diseases. Excessive physical exertion, blows, or overstrain from reaching or lifting may also bring about miscarriage. It is also well known that abortion may be due to the taking of certain drugs or to the criminal use of instruments. Either of these acts very often results in grave injuries to the patient, and not infrequently death has occurred. No drug will bring about abortion with any certainty, except in such quantity that it would be dangerous to the life of the woman who takes it.

Treatment.—Pains, of the same character as labour pains, and bleeding, are the two main symptoms of a threatened abortion. The patient should go to bed immediately and the bottom end of the bed raised. If the pain and bleeding continue, a doctor should be called in immediately. In cases of abortion a doctor or nurse should make certain that the entire contents of the womb have come away, as fragments of the after-birth are apt to remain attached to the womb, giving rise to chronic discharge and blood-poisoning. Many women take it for granted that the after-treatment and convalescent period are not so important after an abortion as they are after a normal childbirth; this is quite wrong. The same care and rest should be taken in order to allow the womb to recover its normal health.



Abscess

ABRASION.—Abrasion is the term generally applied to a slight injury of the skin or of a mucous membrane. The most important thing is to keep the wound clean, and this may be done by applying a simple antiseptic lotion, such as boracic lotion, or iodine, and covering with a dressing in order to prevent germs from entering.

ABSCESS.—An abscess is a collection of pus, or matter, which comes to a head in any part of the body. The centre of the abscess where the pus collects, has a yellowish appearance, and is surrounded by a hot and painful area of hard, reddened flesh which is called the abscess wall, and which serves to keep the pus away from the healthy flesh. There is usually quite a definite swelling and the pain is a throbbing one. Abscesses are due to germs which find their way through the skin or mucous membrane and proceed to form pus. Healthy persons with good pure blood are not so likely to get abscesses as weakly, run-down people are, whose blood is poor and whose tissues put up little resistance when they are invaded by germs.

Plenty of nourishing food, rest and fresh air and a tonic, should therefore be taken by anyone who is inclined to have abscesses.

ABSCESS, COLD.—There is a form of chronic abscess which is due to the tubercle bacillus, and which is called a "cold abscess." It is of slow development and in the early stages may give rise to few or no symptoms. The usual signs of festering are not often present, but pus is slowly gathering under the skin and its presence may be recognized from the fact that the skin pits on pressure, i.e. remains white for a short time after it is pressed. If left to itself the pus may eventually break through the skin and drain away in the same way as acute abscesses, but if the condition is recognized the patient should at once be taken to a surgeon. This form of abscess is most frequently found in children and young people, and if the original point of infection cannot be got rid of the outlook is not very favourable. In any case the same care and long treatment is required as in other forms of tuberculosis. The parts most often attacked are the spine, hips, joints, genito-urinary organs and the glands.

Treatment.—In the very early stages non-operative treatment may be tried, and a cure is sometimes obtained. The first essential of such treatment is absolute rest of the affected part for a very long period, even for several years. This rest is secured by means of splints and plaster of Paris bandages or jackets. The patient in the meantime should live almost entirely in the open air on a generous diet which includes eggs, milk and butter in abundance. Cod-liver oil, or halibut-liver oil, should be taken daily.

Abscesses which are described under separate headings are Gumboil, Whitlow, Breast Abscess, Iliac Abscess (Appendicitis), Ishio-rectal Abscess, Lung Abscess, Psoas Abscess, and Retro-pharyngeal Abscess. (*See also* DISEASES OF THE BRAIN, BONE, RECTUM AND ANUS, LUNG, LIVER, SPINE, EAR, GLANDS *and* JOINTS.)

ABSCESS, EXTERNAL. — An external abscess is one which forms in the fleshy parts of the body, or in glands or the cellular tissue just under the skin. The original seat of infection being near the surface of the body, there is little resistance to the growing mass of suppuration, and the pus tracks outwards until the skin is forced to give way and provide an outlet for it.

Treatment.—The treatment of an external abscess should be directed towards maintaining the strength, and therefore the resisting powers, of the patient, and assisting the pus to come to the surface or to point as it is called. The patient should therefore rest and especially should keep the affected part at rest. If the temperature is raised, the resting should be done in bed. Hot fomentations or poultices should be used continuously and as hot as the patient can bear comfortably, until the abscess begins to point, when it should be opened. Antiphlogistine is a very convenient form of poultice. To leave the abscess to burst of its own accord only means a longer period of suffering for the patient, and the additional risk of septicæmia or blood-poisoning. After the abscess has been opened with a carefully sterilized instrument—and this operation should be carried out by a doctor—special care should be taken to keep the wound clean. The wound should be squeezed to expel as much pus as possible, and then the surrounding skin should be cleaned with a mild disinfectant. A dressing of boracic lint wrung out in warm water, should be laid on the wound and covered with oil skin. After the abscess has been opened no further poultices should be used, but antiseptic dressings applied. (*See also* BOIL; CARBUNCLE.)

ABSCESS, INTERNAL,—An internal abscess is one which forms in one of the internal organs of the body, such as the liver, kidneys or lungs, or in one of the passages through the body such as the bowels, the œsophagus, the bladder, etc. These internal abscesses are always a matter for the doctor and are often a very serious affair. The earliest symptoms are a more or less localized pain of a throbbing nature, a general feeling of illness and a rise of temperature, with shivers, headache and possibly fleeting pains in the limbs. These internal abscesses almost always require surgical treatment, and in many cases, such as abscess of the appendix (Appendicitis), the patient's life may depend upon the abscess being opened by the surgeon before it has time to burst of its own accord into the abdominal cavity.

ABSINTHE.—This is a French liqueur which is green in colour and flavoured with

the leaves and tops of the wormwood plant. It contains a large amount of alcohol as well as oils of aniseed, marjoram, and other aromatic oils.

Poisoning by Absinthe.—The absinthe drinker is liable to show symptoms of poisoning after quite a short period of drinking—sometimes in less than twelve months. There may be convulsions in which the patient not only shouts and screams, but he may show dangerous maniacal tendencies as well, striking himself and anyone near him. In addition, he may show signs of general nervous disturbance, giddiness, and morning nausea. Another symptom is a very marked sensitiveness of the skin: the lightest touch may appear to cause the patient intense pain. At night there is often great pain in the muscles, and sleep is disturbed with horrible nightmares and hallucinations. The patient very soon begins to show signs of mental deterioration. Treatment consists of removal of all alcohol and plenty of fresh air, exercise, and a nourishing diet.

ABSORPTION.—This means that one substance takes up or absorbs another. The absorbent most often used in medicine is wood charcoal which is given as a powder, or in the form of lozenges or biscuits to absorb gases in the stomach or bowels, thus relieving flatulence. Charcoal has also been recommended as a means of removing the odour from foul ulcers.

ACARUS.—This is the name applied to a tick, or mite, which takes up its abode in the skin, and is responsible for the skin disease known as the itch or scabies.

ACCIDENTAL HÆMORRHAGE.—*See* BLEEDING.

ACCIDENTS.—Strictly speaking, an accident is something that occurs to a person without his expecting it and without his being able to prevent it at the time. The term includes injuries of all kinds, from a black eye to a fractured spine, some trivial and others inevitably fatal. A bruise is best treated by cold compresses, firmly applied; in the later stages massage and gentle movements will prevent stiffness. A sprain requires firm bandaging of the affected joint and massage at an early stage; many so-called severe sprains are really fractures of a bone and should therefore be X-rayed to make certain. The treatment of a wound of any description should be directed, first, to stopping any bleeding, and second, to the application of sterile or at least clean dressings. (*See also* FIRST AID.) A fracture is usually discovered by the person injured being unable to lift the fractured limb, and on someone else trying to do so there is unnatural bending of the limb accompanied by severe pain. In the case of a fractured arm, the arm should be put in a sling, with the forearm at a right angle to the upper arm. When a leg is fractured it is best to bind the fractured leg by handkerchiefs, etc., to the uninjured one, using it as a splint. The fractured bone should be kept as much as possible in its natural position, to avoid its developing into a compound fracture through an end of a bone breaking through the skin. For burns and scalds the best immediate dressing is cold tea (which contains tannic acid, the latest treatment for burns); carron oil is soothing but is not an antiseptic dressing.

ACCIDENTS, PREPARATION FOR THE RECEPTION OF.—When news arrives that a person who has had an accident is being brought home, select and prepare a room which is easy to get at, if possible on the ground floor. It should be bright, cheerful and airy. No room is so good as the patient's own, if it answers to these requirements. A single bed should be used, to make it easier for medical examination and treatment. Take away the upper bedclothes and place a mackintosh over the mattress under the lower sheet. Protect this with a temporary cover until the soiled garments have been removed and the doctor has made his examination. Have ready hot water in abundance, coffee, brandy and similar stimulants, and clean clothing for the injured person. Provide a small handy table for the doctor, basins, soap, towels, and any available dressings and antiseptics, scissors, pins, nail-brush, and a pail or bucket may be required. Light a fire, and if there is still time, remove unnecessary furniture from the room and clear the passage and stairway.

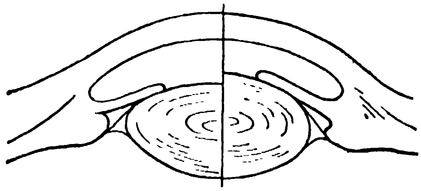
ACCLIMATIZATION.—Becoming acclimatized means the process of becoming accustomed to the climate, water, etc., of a country to which a person has removed. During the course of centuries human beings have naturally become suited to their surroundings, and any great change in their own particular environment is bound to

cause great disturbance to their health, unless they take special care. For instance, when a negro comes over to England he runs much greater risk of getting tuberculosis, pneumonia, or bronchitis than a white man does who is accustomed to our cold climate. In just the same way, a white man who goes abroad to a hot climate suffers more severely from malaria than a native who has always lived in the region. The process of acclimatization is always a slow one, and in cases where races of people have been forced to change their surroundings, it has always proved to be costly to human life. It may be said that this is one of Nature's ways of eliminating the unfit.

ACCOMMODATION (OF EYE).—When rays of light pass from one substance to another—for instance, from air into glass—they are bent from their direct line, and finally meet at a point, called the *focus*. This is well shown by putting a stick half its length into a pond, when it appears to be bent. Each substance has its own power of diverting rays of light, which is known as its *refractive* power. This is always the same for any given substance. One of the most important practical uses to which refractive power is put is in the use of *lenses* in eyeglasses, telescopes, microscopes, and other instruments.

The eye in health has a changing refractive power; this is known as *accommodation*. If the eye is directed towards a distant object the rays of light entering it should be focused exactly on the retina; and if the eye is turned towards an object a few inches off, as in reading, the elastic circular ligament, in the centre of which the lens is suspended, is drawn together by the muscle, which allows the lens to become more globular. The lens therefore becomes a lens of higher power, and the diverging rays from a near object are still brought to a focus on the retina. The amount of power possessed by the eye of thus suiting itself for far and near objects is known as its range of accommodation.

At the age of 45 the lens has lost much of its elasticity, though this change has been slowly going on through life, owing to the gradual sclerosis or hardening of the lens. By the age of 60, though the lens may be quite clear, it is incapable of this accommodative change in shape. That is, it has now a constant refractive power such as a glass lens has, and its focus is for distant objects only. Consequently, a natural change with advancing years is that persons become unable to read, sew, or do other fine work without



Accommodation of Eye:
Showing Change in the Lens.

glasses, though for distant vision no such aid is necessary. This natural change is known as presbyopia (old-sightedness).

In addition to this, there are three errors in the refractive power of the eye, which may be present at birth, or come on early in life, or in the course of some disease, and persist through life. In these conditions the movements of the lens are not always sufficient to focus rays of light accurately on the retina. They are known as astigmatism, hypermetropia, and myopia. (*See also* VISION, ERRORS OF.)

ACCOMMODATION, PARALYSIS OF.—This may vary in several ways. It may be partial or complete, in one or both eyes. It may occur alone, or associated with paralysis of one or more of the eye-muscles. The symptoms resemble those of presbyopia, but in paralysis of the accommodation the amplitude of accommodation does not correspond with the age of the patient. In myopics (short-sighted persons) the condition gives rise to so very little trouble that it is frequently missed on examination.

The three most common causes are:—atropin, either by the use of drops or taken internally; diphtheria; and syphilis. Other causes are influenza, exposure to cold, bruise of the eyeball, diabetes, and disease of the central nervous system, especially locomotor ataxy.

The cause, if possible, must be treated. Tonics are sometimes useful. If the condition persists, correcting glasses for near work will have to be resorted to. The results of treatment are very variable, except in diphtheritic cases, which usually recover of their own accord in from four to eight weeks.

ACCOMMODATION, SPASM OF.—This is often found in anyone with faulty accommodation, and is due to the habit of overcoming the fault by an involuntary over-usage of the muscle of the lens. The patient will complain, for instance, that after reading for some time, he cannot "focus" objects on the other side of the room; they look blurred and misty; but after a varying period the condition will go off, and his distant vision be as good as before. Cases of severe spasm occur sometimes, which are very distressing; in these there is always a nervous element.

The eyes, after examination under a mydriatic (a drug which dilates the pupil, and is of great use to the oculist), should be treated with the following:—

Rx. Homatropin gr. I
Distilled water oz. I.

Drops of homatropin should be put in at bedtime. They "quieten down" the muscle, and do not give rise to discomfort on the following day.

Correcting glasses are also ordered. At first great difficulty may be found in adapting the eyes to them, i.e. spasm occurs, but their use should be persevered with. After a short time they will be quite comfortable.

ACCOUCHEMENT.—The French term for child-birth. A professional male attendant at child-birth is called an accoucheur and a professional female attendant an accoucheuse, but this term should not be applied to the ordinary midwife.

A.C.E. MIXTURE.—This is a mixture of alcohol, chloroform and ether, and is often used as an anæsthetic.

ACETABULUM.—A cup-shaped depression on each side of the pelvis, into which the head of the thigh bone (femur) fits.

ACETANILIDE.—White crystals, produced by boiling the substance called anilin and glacial acetic acid together for several hours, when crystals form. They can be dissolved in hot water, alcohol, or ether. The importance of acetanilide is that under the name of antifebrin it was one of the first drugs discovered to be useful in lowering the temperature in fever, but it is now no longer used for this purpose.

Acetanilide may produce serious symptoms, such as collapse and difficulty of breathing. Certain proprietary headache cures contain this drug, so it would be advisable when purchasing any patent cure to find out what it contains. In cases of collapse, the patient should lie down, and should be made to vomit by giving him a tablespoonful of mustard in half a tumblerful of warm water. The patient should be kept warm until the doctor arrives.

ACETIC ACID.—Acetic acid is the acid contained in vinegar. It is a colourless liquid and must not be taken internally. Acetic acid or vinegar is very often taken internally as a means of reducing stoutness. Whether it has the desired effect it would be difficult to say, but it would certainly be at the expense of good health. It is often applied to warts and corns, but great care should be taken when using it for this purpose, as, owing to its burning action, it may cause irritation to the surrounding skin. Vaseline should be smeared around the corn or wart in order to safeguard against any accident. Application of the acid should be made by a glass rod or by wrapping some cotton-wool around a match or orange-stick and dabbing immediately over the part. This should be carried out daily, but if any redness or irritation should occur, the applications must be stopped and not resumed until all symptoms have disappeared.

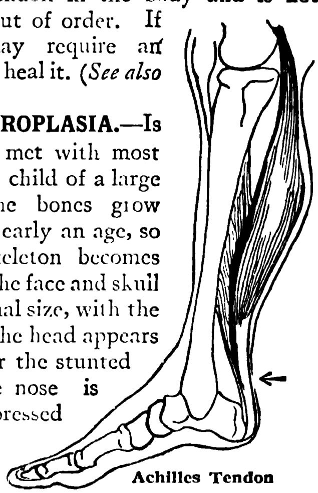
Dilute acetic acid is a 5 per cent. solution of acetic acid, and it may be used largely diluted as a lotion for inflamed joints, and to bathe the skin in cases of fever. It may be given as an antidote to poisoning by alkalis such as strong ammonia, caustic potash or soda. Two or three tablespoonsful should be given in a little water.

In cases of poisoning by strong acetic acid, the mouth is burnt, and the breath has an odour of vinegar. The treatment is to give chalk or whitewash in water immediately, and later white of egg or olive-oil. No emetic should be given.

ACHE.—This term is applied to any continuous or throbbing pain. It may occur owing to a variety of conditions. For instance, in rheumatism, it is not unusual for people to describe their symptoms as a "dull ache." In cases of abscess the pain may be of the throbbing variety.

ACHILLES TENDON. — The Achilles tendon is the tendon at the back of the heel. It is so called after Achilles, one of the Greek leaders against the Trojans, about whom the story is told that his mother dipped him in

the river Styx as a baby in order to make him invulnerable. Unfortunately she had to hold him by some part of his body while she dipped him into the river. She therefore held him by the smallest possible place she could grip him by, which was the narrow part of the back of his heel. When he grew to manhood no spear or arrow could harm him, until one day his enemy, Paris, shot him in the back of the heel and thus killed him. The muscles of the calf of the leg are attached to the heel bone by this tendon. It is the strongest tendon in the body and is not easily put out of order. If torn, it may require an operation to heal it. (*See also* FOOT.)



Achilles Tendon

ACHONDROPLASIA.—Is a condition met with most often in one child of a large family. The bones grow hard at too early an age, so that the skeleton becomes dwarfed. The face and skull are the normal size, with the result that the head appears too large for the stunted body. The nose is usually depressed at the bridge and is described as "saddle-shaped." The child develops normally and is healthy and intelligent. A peculiarity of these children is the extraordinary way they rise from the sitting to the standing position without bending the knees. Pairs or troupes of achondroplasiacs may be seen appearing as professional comedians. There is no known cure for the condition and no treatment is needed.

ACHYLIA.—Deficiency of the normal gastric juice in the stomach.

ACID.—This is a term generally applied to any substance which has a sour taste. In chemistry, substances which turn blue litmus paper red are called acids; while substances which turn red litmus paper blue, or do not change blue litmus paper, are called alkalis. The majority of acids contain oxygen, and are known as *oxyacids*; those not containing oxygen are termed hydrogen acids or *hydracids*. It should be noted that many acids are poisonous and some are corrosive.

Treatment of Acid Poisoning.—If strong corrosive acid is taken internally it produces a burning sensation in the mouth, throat and stomach, and this is followed by severe pain. The patient should be given liberal doses of chalk, magnesia, baking soda or whiting in water. The doctor should be called at once, but in the meantime *no* emetic should be given to the patient to cause vomiting. Demulcents may be given, such as white of egg, olive-oil, or arrowroot. As the patient may have difficulty in breathing owing to irritation of the throat, cloths wrung out in hot water may be applied to relieve the pain. (*See also* FIRST AID SUPPLEMENT.)

ACIDITY.—Commonly called "heart-burn," is a condition in which there is a sour or burning taste in the throat and at the back of the tongue, due to sourness of the stomach and the welling up of acid fluid from the stomach into the mouth, together with an increased flow of saliva. The condition may arise from either there being too much hydrochloric acid in the gastric juices of the stomach or from the lack of sufficient hydrochloric acid owing to fermentation in the stomach. In the former case alkalis should be taken after meals; and in the latter case a mixture containing dilute hydrochloric acid should be taken. (*See also* HYPERCHLORHYDRIA, HYPERSECRETION, HYPOCHLORHYDRIA.)

ACIDOSIS.—This means a condition in which there is not enough alkali in the blood, with the result that the acids are present in too great a proportion. In children, acidosis often accounts for the long continued slight feverishness to which some children are prone and for which no obvious reason is visible to the parents. Care should be taken that such children are not described as "nervous" and left without any attempt at remedying their deficiency of alkalis. A still worse fault is to consider the condition to be due to rheumatism and to give acid in the form of salicylic acid, which makes matters worse. In grown-up persons acidosis may cause feverishness, headache, neuralgia, faintness, dyspepsia and the form of difficulty in breathing in which the patient suffers from "air hunger." A striking result of acidosis is extreme drowsiness amounting almost to a state of coma.

Severe starvation leads to acidosis, and the faint but characteristic smell which the acids

impart to the breath and urine of a fasting person is supposed to have given rise in the olden days to the expression "the odour of sanctity."

In order to prevent acidosis it is necessary to see that there is a sufficient supply of carbohydrate in the diet, and in the case of diabetes, insulin. Bicarbonate of soda should be taken several times a day, and glucose up to 2 oz. a day.

ACNE (Acne vulgaris).—Acne, or "Blackheads," is probably the most common form of chronic skin disease, and is most usual between the ages of sixteen and twenty-six. It is said to occur most often in dark males, but both sexes and all colourings are almost equally affected. It attacks certain definite areas of skin: the forehead, nose, and cheeks; the ear; the back of the neck; and the upper part of the body, both back and front. In rare cases, it covers the whole of the trunk and the limbs.

After thirty years of age it is very rare; and a disease resembling acne occurring after that age, generally signifies that the patient has been taking some drug, especially the iodides and bromides, or that his work brings him into contact with such irritating substances as tar, paraffin, or chlorine.

The essence of the disease is hyperkeratosis or overgrowth of the horny layer of the skin. In the mouths of the sweat glands of the skin this overgrowth forms a *comedo*, which is a tiny black speck shaped like an elongated onion, and with its horny scales arranged in a similar way. The yellow material which can be squeezed out below this black speck is not really part of the comedo, but is oil which has been unable to get away. In this will be found the roots of a hair, a germ known as the *Bacillus acnes*, and several varieties of other germs, which add to the trouble. The comedo or "blackhead" as it is commonly called, does not get its colour from dirt, but from the upper layers of the blackheads becoming dry and horny, and changing in colour as they do so.

Some of the blackheads become irritated, and papules or pimples are formed, which become more or less inflamed. These go on until they form pustules, or tiny abscesses, which range in size from a pin-head to a pea. The number of these pimples depends to some extent on the health of the individual; the more run-down the patient, the greater the crop of pimples.

Sometimes a condition known as "hard acne" occurs. In this there is considerable thickening of the flesh beneath the skin, and abscesses begin to form. These show themselves as red, hard, painful lumps, sometimes half an inch across. They last for weeks or months, fester slowly, and leave a permanent scar.

The skin in acne becomes hardened and is oily, anæmic, and flabby from want of tone in the muscles of the skin.

Acne, causes of.—The cause of acne is now generally considered to be the *Bacillus acnes*, which is always found in the comedones. Among other causes are the increased activity of the skin and hair at the age of puberty, and the changes in the glands which occur at that time. Seborrhœa (dandruff) of the hair and skin (*See* SEBORRHŒA) is very frequently found with acne, and many specialists believe that there is a definite connection between the two diseases. The treatment of acne should therefore always include that of seborrhœa. Other contributory causes are defective general nutrition, constipation, anæmia, and menstrual irregularities.

Treatment.—The main factors in the cure of acne are time, attention to the general health, and perseverance with local treatment. Most cases, even if untreated, slowly clear up in the twenties; but few patients are willing to endure an unpleasant disease for years without some attempt at curing it. Also the scars left are as disfiguring as the disease, and one may act as a starting-point for worse trouble.

With regard to general treatment, the patient should attend most carefully to the rules of hygiene. He should take regular exercise in the open air, and eat plain but sufficient food, avoiding the rich, "fried-fat" type of diet, and having instead plenty of vegetables and fruit. A cold morning bath, followed by a brisk rub-down with a rough towel, helps to promote a healthy reaction of the skin. A general tonic is often useful; constipation, anæmia, and menstrual irregularities, if present, should be treated. The first, especially, is often to blame for a continued unhealthiness of the skin which, though not actually causing the disease, renders it unfit to combat infection.

Internal remedies for acne proper are of little or no use; several have been advocated from time to time, but have invariably proved disappointing.

With regard to local treatment, one has always to remember the local symptoms of tough skin, greasiness, anæmia, and flabbiness. One treatment, luckily, has an influence on all four, and that is the vigorous washing with plenty of soap accompanied by rubbing, which not only removes the grease and thickened horny layer, but by means of the friction with which it is applied, invigorates the blood-supply and the muscles. Sulphur soap is generally recommended. This method of treatment is most conveniently carried out at night before going to bed. The simplest way of applying the soap is to make a very stiff lather (some people use a shaving-brush kept for the purpose), rub it very well in, and leave on until the skin begins to smart, then wash off with hot water. At first the patient can only stand a few minutes of the soap application, but the time can gradually be lengthened until he can leave the lather on for hours at a time, or even all night. On one evening a week vaseline only should be used, to avoid too great an irritation of the skin.



Common Type of Acne vulgaris

Some authorities recommend steaming the face before beginning this treatment, so as to soften the blackheads, and then removing them by means of a comedo-extractor (which can be purchased for about 6d). This should be kept absolutely clean. The common practice of squeezing the comedo out with the nails should be given up; slight bruising is caused, and pustules form more readily in the damaged skin. A rubber sponge, used without soap, is good in some cases where the comedones are fairly loose.

After the face has been washed a sulphur lotion, of which there are endless varieties, should be applied on a cotton-wool swab.

Any pustules should be opened and cleaned out with hot boracic lotion. Carbolic acid is very useful in preventing recurrence, but should only be used by a doctor. If there are many blackheads, the soap treatment should be used more cautiously—though the skin, in virtue of its "horniness," is very tough in acne—and if it is found too painful, sulpho-calamine lotion should be used. This should be shaken, and painted on with a brush.

The effect of this treatment is to obtain a slow peeling of the horny layer, a removal of the comedones, and a healthy reaction of the skin by means of the massage. In very resistant cases, however, a more drastic method of peeling the skin with resorcin is employed. Resorcin of 30 to 50 per cent. strength in zinc paste is applied at night, left on 30 to 50 minutes, or until "burning" occurs, then wiped off with cotton-wool dipped in olive-oil. The face is then washed in the ordinary way, and cold cream applied. This process should be repeated several times daily until the skin begins to peel, bringing with it the horny layer and many comedones. The patient must remain indoors during the whole of this treatment; but, in a bad case, it "does more in a week than a milder treatment would accomplish in two months." After peeling is complete, a soothing ointment is applied. The treatment may need to be repeated once or twice before a satisfactory result is obtained.

There are far too many variations of these older methods of treatment to give in detail, but the above may be taken as a fair sample. Among newer methods, the use of X-rays, light treatment, or a judicious mixture of the two, are becoming more and more popular. They are used to produce an artificial inflammation of the skin—the X-rays having the stronger effect and being especially useful in cases of "hard acne" in much the

same way as with the resorcin paste. These methods are often best used after a preliminary medical treatment, as if they, especially X-rays, are used before any other kind of procedure it is not uncommon for the disease to become worse for the time being. General improvement, however, occurs after a short period, so that no anxiety need be felt by the patient. Vitamin D is said to have a good effect on acne, and irradiated ergosterol (obtainable under various patented names) internally is said to be helpful; this treatment, however, is still on trial.

Minor surgical methods, such as drilling out the comedones and treating the pustules with a "rotary punch," may be employed by a very patient operator; but as each treatment takes a long time and is rather painful, these methods are not popular with either doctor or patient.

Vaccines were much advocated at one time, and seem to be useful in the hands of a competent and experienced practitioner, but the results on the whole have been disappointing. Some cases do very well, others are unaffected, and some are definitely worse.

ACNE ROSACEA.—This is a skin disease which appears only on the face. It starts as a slight flush or congestion of the nose and cheeks, sometimes of the chin and the middle part of the forehead. This redness, which is due to over fullness of the surface blood-vessels, is apt to become chronic. Accompanying this, there is often an oily appearance of the skin, with red pimples and spots; the appearance is rather like that in ordinary acne, though comedones (blackheads) are absent, and the nose becomes coarsened and enlarged. Most modern authorities, indeed, object to the term "acne" in connection with "rosacea," which is an entirely different disease, but its use is so convenient that so far it has not been generally given up. Evidently the disease was very common in Dickens' time, judging from his descriptions and the original illustrations. He has many characters whose face, like Mrs. Gamp's, "was somewhat red and swollen, the nose in particular." It occurs in middle life, and is said to be more common in women than in men.

There are various reasons given for the cause of rosacea, into which it is not necessary to enter in detail. Probably the correct view is that everything that causes a chronic distention of the blood-vessels in the skin of the face will help to cause rosacea. Seborrhœa of the scalp certainly acts as an irritant in a great number of cases, and it should always be looked for and treated if present.

Alcohol is also to blame, though in fewer cases than formerly; but any form of dyspepsia which leads to flushing of the face can be to blame; and heat, cold, wind, weather, and strong light all act as predisposing causes.

Treatment.—General health treatment is of special importance in this disease. Particular attention should be paid to regularity of the bowels, opening medicine being taken at least twice weekly whether the patient needs it or not. As to diet, the patient should avoid anything which he notices causes flushing of the face, especially alcohol, tea, coffee, highly-flavoured dishes such as curry, condiments and tobacco. Vegetarianism has been suggested in obstinate cases. Extremes of temperature should be avoided as far as possible, even to taking warm baths in preference to hot or cold.

As regards local treatment, seborrhœa of the scalp if present, must be treated. It is useless to try to cure rosacea without removing one of its chief causes. Sulphur in some form is applied to the face, either as a lotion or in the form of sulphur soap.

If the skin is very irritable, a calamine lotion should be used for a few days, before beginning the sulphur treatment.

In the more chronic cases the sulphur treatment will not produce much effect; it is then necessary to use something to make the skin peel, such as the resorcin paste method described for acne vulgaris. The soap massage and steaming methods, so useful in acne, are of course quite unsuitable here.

If the blood-vessels are very numerous and much dilated, treatment by light and X-rays is by far the most satisfactory. Very prominent vessels may be destroyed by the galvano-cautery.

ACNE VARIOLIFORMIS.—Acne varioliformis is not nearly so common as Acne vulgaris, and may be distinguished from it in several ways, though at first glance it appears similar. It occurs only in adults, and affects chiefly the "hat-brim" area, i.e. the borders of the scalp, especially on the face. Rarely it extends further, and then is usually very pronounced on the point of the

nose, and extends up on to the scalp. It commences as a firm reddish pimple, which feels "shotty" at first, and later becomes pustular, resembling closely the pustule of variola or smallpox—hence its name. Like variola, too, there is scarring when the crust of the pustule separates, which scarring is, of course, permanent. No comedones are formed. Like acne vulgaris, this disease is practically always associated with seborrhœa of the scalp.

Treatment.—The local treatment of acne varioliformis may be the same as that of acne vulgaris, though in most cases any mild antiseptic ointment will suffice. This must, however, be used till the cure is absolutely complete, or there will be disappointing recurrences. The associated seborrhœa must be treated along with the acne, or no cure will be effected. The hat-lining should be cleaned in the same way as described for seborrhœa.

Internally, iodide of potassium and arsenic are often prescribed; cod-liver oil and iron are of value in debilitated cases. Vaccines are said to be more useful here than in cases of acne vulgaris. (*See also* ACNE VULGARIS *and* SEBORRHŒA.)

ACONITE.—Aconite, aconitine, and their preparations are obtained from roots collected from *Aconitum Napellus* or monk's-hood. The root, which is dark brown outside and white inside, is dried in the process of extracting the aconite. It has often been mistaken for horseradish and, as aconite is a powerful poison, the results have sometimes been fatal.

Aconite produces local anæsthesia on the skin and it is frequently used in cases of neuralgia. Care should be taken that it does not come in contact with any mucous membrane or broken skin. It is used a great deal in the form of an ointment, but much more frequently as a liniment. This drug was, at one time, used internally in cases of fever, with the object of decreasing the force and tension of the pulse.

Poisoning by Aconite.—The symptoms come on very quickly when this most powerful poison has been taken internally. In a few minutes there is a severe tingling sensation and burning in the mouth, followed by numbness. Vomiting usually takes place after an hour or two and is very severe in character. The burning sensation is usually felt in the stomach also, and the skin may feel very cold and clammy. The pupils of the eyes are usually enlarged and the eyes may become fixed and staring. The muscles become weak and the pulse is very irregular. Death takes place from suffocation and the patient is often conscious to the end.

Treatment consists of washing out the stomach as promptly as possbile. Emetics should be given; one to two tablespoonsful of mustard in half a glass of warm water is a very common one. Artificial respiration should be administered early. Strychnine and digitalis may be given hypodermically, and brandy or strong coffee should be given per rectum. Hot blankets and hot-water bottles should be placed around the patient's abdomen and extremities. Artificial respiration should be kept up unceasingly. (*See also* ARTIFICIAL RESPIRATION; FIRST AID SUPPLEMENT.)

ACOUSTICS.—The science of sounds, on which hearing depends.

ACQUIRED CHARACTERISTICS.—The changes in one or more organs of the body which have occurred during the lifetime of the individual.

ACRIFLAVINE.—This is also termed flavine, and is a new antiseptic which is powerful in character, but quite harmless. It is bright yellow when mixed with water.

ACRODYNIA.—The name of this disease, derived from the Greek, means "pain in the extremities," and this describes its most troublesome symptom. It is a comparatively rare disease, but sometimes breaks out in epidemic form. It is probably toxic in origin, i.e. is due to poisons in the blood, though there are no symptoms of fever. It is found amongst uncleanly people.

The symptoms are those of a severe "bilious attack," nausea, vomiting and diarrhœa; pains in the extremities, followed by loss of feeling; and a rash which varies in character, from red spots to small or larger blisters. It usually clears up entirely in a month to eight weeks.

The treatment is to treat the symptoms. Counter-irritation over the spine is generally advised.

ACROMEGALY.—This is a strange disease affecting certain bones of the body, especially the bones of the head, hands, and feet. The bones become enlarged and other tissues may become affected. It is due to some

alteration in the working of the pituitary gland, the little gland which lies at the base of the brain and manufactures a substance which is necessary for the growth of the body. In some cases a change in the pituitary gland causes growth of the whole body, especially if it occurs early in life, but if it occurs later, the over-development is more local. Sometimes there may be a serious loss of sight owing to the pressure of the pituitary growth on the nerves of the eye. Pituitary extract and thyroid extract have proved of some benefit in a good many cases, and surgical operation may be tried. (*See also* BRAIN; DUCTLESS GLANDS.)

ACROMION.—The acromion is a bony projection at the summit of the shoulder-blade or scapula. Frequently this is injured by a fall from a horse, but more often the collar-bone which is attached to it is broken through the force of the blow.

ACTINO-THERAPY.—This is the medical name for treatment by artificial sunlight, and by the different rays that go to make up sunlight, such as ultra-violet rays, etc. (*See also* LIGHT TREATMENT.)

ACUTE.—If an illness begins suddenly and gets quickly worse with pronounced symptoms, which in a few days or even hours are at their height, the illness is called *acute*. Diseases are described as acute, sub-acute or more gradual than acute, and chronic where the condition settles down and remains for a long period of weeks or months in a stationary condition without becoming either acute or cured. (*See also* DISEASE.)

ADAM'S APPLE.—The lump seen under the skin in the front of the throat is commonly known as the Adam's apple. It is really the most prominent cartilage of the larynx, and is much larger in men than in women. (*See also* LARYNX.)

ADDER BITE.—The variety of adder or viper which is to be found in Great Britain is very rarely fatally poisonous. Sometimes children die from their poison, or persons in a weakly state of health. (For treatment *see also* BITE; BITES AND STINGS.)



Adenitis of Glands of Neck

ADDISON'S DISEASE.—This disease was named after the physician, Thomas Addison, who was on the staff of Guy's Hospital in the early part of the nineteenth century. It is usually due to tuberculosis of the suprarenal capsules, two glands which are situated just above the kidneys. The symptoms are the bronze colour of the skin, extreme muscular weakness, vomiting, and enfeebled heart action. The blood-pressure is low and the temperature is usually subnormal. Secondary anæmia may be present. Recovery has been recorded in some cases, but the disease is a very serious one and death may occur in a few weeks or be delayed for several years. The introduction of injections of cortical extract (eucortone) has undoubtedly brightened the outlook for recovery, but at present this remedy is very expensive. (*See also* DUCTLESS GLANDS.)

ADDUCTOR.—Muscles which move the structures to which they are attached towards the middle line of the body are called adductor muscles.

ADENITIS.—This term means inflammation of a gland. Inflammation of the lymph glands of the neck is common and often due to unhealthy tonsils. (*See also* LYMPHADENITIS.)

ADENOIDS.—This is common among young children, and is due to inflammation and swelling of the mass of tissue that lies between the nose and the throat, up behind the uvula. The uvula is the flap of tissue that can be seen hanging down at the back of the mouth guarding the entrance to the throat. Behind the uvula and higher up, quite out of sight except when looked for with a special mirror on the end of a long handle, lies a mass of tissue which is called

the naso-pharyngeal tonsil. A swollen condition of this is known as adenoids. It is composed of the same sort of tissue as the ordinary tonsils, and is always normally present in young children, but it should not be so large and swollen that it blocks the back of the nose and interferes with the child's breathing. Catarrh in the nose and infectious fevers are common causes of the inflammation and swelling which cause adenoids. Infected adenoids are a common cause of deafness and of inflammations of the ear in children. A child with adenoids usually has a characteristically "stupid" look, with open mouth, long face, narrow nose, prominent front teeth, high arched roof of the mouth and flat chest. But in the early stages of the condition, all or at least some of these symptoms may not be present, and the adenoids may only be detected on examination by a doctor.

Treatment.—There is no doubt that the best treatment for adenoids is removal by operation, which is only a slight affair, and the child's health nearly always improves at once. Whether the tonsils should always be removed at the same time is another matter: under the age of five it is not usually advised nowadays, unless there are enlarged glands in the neck.



B

Tonsils and Adenoids

A Adenoids, B Left Tonsil and C Right Tonsil, removed from a child aged 7.

ADENOMA SEBACEUM.—This disease is characterized by an overgrowth of the sebaceous glands of the face, forming tumours. They are whitish or reddish-yellow in colour, and cover the whole face, being most numerous on the nose, cheeks, and chin. Enlargement of the small veins of the face also takes place, which adds to the mottled appearance of the patient. As a rule the tumours are between a pin-head and a split pea in size, though occasionally one enlarges. They cause no trouble beyond that of disfigurement.

The disease occurs most frequently in children who are mentally below par; there is often a history of internal tumours, and of fits in infancy. It has been suggested that adenoma sebaceum is due to the treatment of the fits by large doses of potassium bromide. As the child grows up, the disease tends to abate.

Obviously, there is no treatment but that of removal of the tumours.

ADHESIONS.—By adhesions are meant the undesirable attachments that occur in a joint or organ after injury or inflammation. Any joint which has been injured is very apt to become stiff and limited in its range of movement. To prevent adhesions, massage and movements of the joint are begun at an early stage in the treatment. If the joint does become set it may be a very troublesome business to get back its range of movement, and the adhesions may have to be forcibly broken down under an anæsthetic.

The inflammatory type of adhesion occurs mostly in the abdomen or lungs, and may follow an operation, or inflammatory disease, but in some cases there does not appear to be any inflammatory cause and the abdominal adhesions seem to arise as a separate disease. They are not dangerous in themselves, but may cause great inconvenience by obstructing the working of the organ to which they are attached. In the abdomen they may cause strangulation of the bowel or may upset the working of the stomach.

Treatment.—If the condition is very bad it may be necessary for the patient to have an operation for the cutting down of the adhesions, but as they are apt to return even after operation or a new lot may arise, it is as well to try non-surgical treatment such as massage and electricity before resorting to operation.

ADHESIVE PLASTER.—This is better known as sticking plaster and is chiefly used for holding dressings in position over a wound. The plaster is applied and held in position for a few moments, the heat of the body usually causing it to stick and hold fast. Some plasters require to be warmed before they will act satisfactorily. If the plaster is difficult to remove, it should be well soaked with hot water. A quick tearing off will be found less painful than gradual peeling.

ADIPOSE TISSUE.—Fatty tissue distributed throughout the body, the cells of which contain fat-globules. (*See also* OBESITY.)

ADIPOSIS DOLOROSA.—Adiposis dolorosa, or Dercum's disease, is characterized by the formation of soft nodules or swellings throughout the flesh of the body, accompanied by neuralgic pains. This usually occurs in women after middle age. Treatment is not very satisfactory, but injections of pituitrin and adrenaline may prove helpful.

ADOLESCENCE, IN BOYS.—Adolescence or "growing up" in boys usually lasts about ten years, from the age of fifteen to about twenty-five. This is the most critical time in the life of a man, as it is during these years that his character is formed and the basis for his conduct during the rest of his life usually takes shape. It is a stage which is full of difficulties, and one which should interest the parents or guardians to the fullest extent.

The term puberty is given to the age at which a boy becomes capable of being a father. The age varies between twelve and seventeen years, but in temperate climates it is usually around the age of fifteen. The most obvious outward sign of this change is the breaking of the voice, which commences to assume its bass character after a very embarrassing period of intermittent squeakiness. Hair also begins to make its appearance on the face. The internal activities which are going on in the body at this period are very important ones. The reproductive organs undergo considerable development and become very sensitive to mental and physical stimulus. The sexual instincts begin to show themselves, and the instinct for fatherhood, which is one of the strongest instincts in nature, is unconsciously being aroused. It is at this period that the proper teaching of the meaning of sex should be carried out. The question of whether a boy should be told or not should never arise. It is the duty of every parent or guardian to advise a boy to the best of their ability on all matters connected with sex. It is much healthier for the boy to learn of these matters in a clean and wholesome manner. There is no doubt that ignorance or the acquirement of knowledge from evil companions has caused a great deal of unhappiness in many ways. The nobler instincts should be appealed to, and the proper care of the body and self-control should be emphasized. At this stage in a boy's life there is usually the desire to prove his manhood and stand well in the eyes of his friends. The perils which beset a growing boy are all recognized, and a little helpful guidance, especially from a man, may do much to clear up mental worries and launch the boy into successful manhood.

ADOLESCENCE, IN GIRLS.—Just as the age of puberty and adolescence plays an important part in the life of a boy, so it is of no less importance in that of a girl. The age at which puberty commences varies between the eleventh and seventeenth year. Adolescence, by which we mean the time in which the girl is growing into the adult type, usually ends about the twenty-first year, but may go on until the twenty-fifth.

During this period the muscles of the growing girl undergo very rapid changes and assist in the development of her bony framework. This often accounts for the characteristic lankiness and "growing pains" which are noticed at this time. Among the most evident changes are those which occur in the shape of the pelvis. The hip bones tend to widen and become more curved. The breasts also begin to undergo glandular changes and show a marked sign of swelling. The young girl is rapidly developing into a young woman with increasing interest in her own appearance. Not only does the complexion seem to take on an added freshness, but the hair becomes brighter and the eyes develop a new beauty of expression.

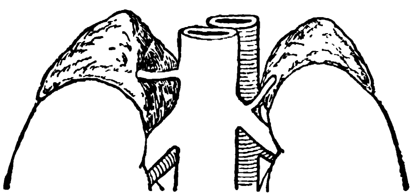
Knowing that all these changes are taking place inwardly as well as outwardly, the mother should be ever watchful to see that the young girl does not over-tire herself by doing too much either physically or mentally. The bones while they are in this stage of development are very soft, and irreparable damage may take place through careless habits. Many slight deformities have had their origin in allowing the child to lean forward on her elbows instead of sitting upright, or from the habit of continually standing on one leg. These little alterations in shape may exert a bad influence over the girl's health, and interfere with the functions of the pelvis in later life.

The periods of menstruation should commence about this time, and should normally occur about once a month. There is a wide

variation in the amount and duration, but it should not be accompanied by much pain or distress. It is true that most authorities say that no pain should accompany the menstrual period, but in the majority of cases there is to be found a certain amount of distress with a marked lowering of the vitality. Any cessation or abnormality of the menstrual period should be looked upon as serious, and medical advice should be sought.

The mental and moral outlook during the period of adolescence is usually developing rapidly in the growing girl. Her doubts and anxieties are numerous, and it is at this time that a mother should show her greatest sympathy and understanding and prepare her for the important part she may be called upon to play later on in life.

ADRENAL.—The word adrenal means "near to the kidney," and is commonly used



Adrenals or Suprarenal Capsules

to denote the suprarenal capsules or adrenals, which are two small bodies placed at the upper end of the kidneys. The juices which they produce, and which are released into the blood as it passes through them, are of great importance to health.

The adrenals, or suprarenal glands as they are called nowadays, are composed of two parts, the *cortex* and the *medulla.* The cortex is absolutely necessary to life, and its destruction leads to the fatal disease called Addison's disease. An extract made from the cortex of animals is therefore being tried now in cases of Addison's disease and is proving a valuable addition to the treatment of that disease. The secretion produced by the medulla is called adrenaline, and the preparations from it are amongst the most useful drugs we possess.

The exact functions of the adrenals have not yet been determined, but they appear to have something to do with growth, maintenance of life and sexual development. Over-activity of the suprarenals or adrenals in children leads to precocious sexual development, which frequently results, in the case of girls, in premature menstruation and in the case of boys by unusual muscular development. In women there may be an excessive growth of hair on the face and body and the appearance may become masculine, with a deepening of the voice. (*See also* Ductless Glands.)

ADRENALINE.—The trade name for a preparation containing the chemical produced by adrenals (the suprarenal glands). It is of great use in arresting bleeding and can be applied locally to the sockets of teeth after extraction, to the bleeding-point in the nose for nose-bleeding, and internally to arrest hæmorrhage from the stomach, intestines, bladder or womb. It is not of much use in hæmorrhage from the lungs. It is also used to increase the blood pressure in diseases where the circulation is poor, and is of great value in the treatment of urticaria, hay fever and asthma. It is given by hypodermic injection in cases of shock, collapse and heart failure, and there is no other drug known which is so successful in re-starting a heart which has stopped beating and in counteracting the effects of chloroform.

ADSORPTION.—The process whereby one substance becomes a part of another without becoming chemically combined with it.

ADULT.—A person of mature or legal age. The age of legal responsibility in this country is 21, though a person is allowed to drive a motor-car at the age of 17, and the age of legal marriage is 16.

ADULTERATION.—This term is applied to the addition of any substance which should not be there, and which may or may not be harmful to the health of the consumer, to an article of food. Milk is often adulterated by the addition of water and this may be very injurious in cases of infant feeding. The addition of any preservative or colouring matter to milk is now an offence against the law.

Chemicals are very often added to preserve certain foods. The law demands that the public should be notified by a label on the articles so preserved, stating the amount of preservative used. But preservatives are often used in excess of the amount allowed by law and such cases should be reported to the medical officer of health.

AEROBIC.—Aerobic means requiring oxygen or air to live. This term is applied

to microbes which require oxygen. Those that do not grow in oxygen are called anaerobic. There are some microbes that are able to grow without oxygen, though they make use of it when present; others grow in its presence, but flourish best without it.

AEROPHAGY.—"Air-swallowing," the taking in and swallowing of air. This is a bad habit usually found in hysterical patients. The patient constantly swallows air and then belches it up again, a habit which can be very disagreeable to those who have to live with him. Occasionally, however, aerophagy may be due to disease of the stomach, such as dilatation of the stomach. In air-swallowing due to nervous causes, the patient should have the matter carefully explained to him and should realize that by resisting all desire to bring up wind he will speedily break himself of the habit. (*See also* FLATULENCE.)

AFEBRILE.—Without fever.

AFFERENT.—This term means carrying towards the centre. Nerves which convey impulses towards the central nervous system are afferent nerves. The same term is applied to blood-vessels, such as the arteries, which convey blood to the tissues.

AFFUSION.—The pouring of water upon the body, or a part of the body, is known as affusion. This method is used to reduce the temperature in fevers.

AFRICAN LETHARGY.—A sleeping-sickness found among West African negroes. The chief symptom is increasing drowsiness. The disease is often fatal, death from exhaustion usually occurs within a few months. (*See also* SLEEPING SICKNESS.)

AFTER-BIRTH.—This is the popular name for the placenta, cord, and membranes by which the unborn child is attached to the womb. The placenta comes away a little time after the birth of the child, and it is of the greatest importance that the whole of these membranes should be expelled from the womb. In cases where a portion has been left behind, there is the possibility of decomposition taking place and blood-poisoning arising. (*See also* CHILDBIRTH; LABOUR.)

AFTER-PAINS.—A short time after a child has been born, pains set in again; these are due to the contractions of the womb expelling the after-birth (placenta, etc.), and pass off again when the placenta has successfully come away.

AGE CHANGES.—Much depends on the amount of wear and tear a person has undergone throughout life, but despite this fact, there are changes in the body which must occur inevitably. After middle age, downhill changes take place in all the organs of the body and the blood-supply becomes poorer. The various glands which provide the internal juices upon which the working of the body depends, become less active as life goes on.

The teeth show very marked changes in old age, usually resulting in the loss of them completely. The joints also are greatly affected and often become diseased and stiff.

The digestive organs become impaired and have to be given due consideration. The diet should become as simple as possible, and the needful amount of food becomes much less after the age of forty. In extreme old age a very small amount of food and sleep suffices.

The body may either lose in weight or become rather corpulent. Another change which takes place in old age is in the hair. It usually becomes very white and may fall out. The mind loses its capacity for grasping things, and it is not uncommon for disease to become evident in the heart, kidneys, and other organs. (*See also* DEGENERATION.)

AGGLUTINATION.—The joining together of blood corpuscles or bacteria is called agglutination. Agglutinins are substances occurring in the blood of a person or an animal suffering from a disease caused by microbes and which are capable of causing the clumping together of the microbes peculiar to that disease. This is exemplified in the *Widal reaction* which is the test for typhoid-fever. The addition of a few drops of a recent culture of the microbe, *Bacillus typhi abdominalis*, to the blood of a typhoid-fever patient causes an agglutination and loss of movement on the part of the microbes, thereby proving that the case is one of typhoid fever.

AGITATION.—Mental disturbance or excitement. Restlessness. From the Latin *agito*, I stir. (*See also* EMOTION.)

AGITOGRAPHIA.—A condition in which the handwriting is defective owing to omission, slurring or distortion of letters or words, occurring in some nervous diseases.

AGITOPHASIA.—A condition of excessive rapidity of speech with sounds or syllables slurred, omitted or distorted.

AGLANDULAR.—The state of being without glands.

AGONY.—Persons may say they are "in agony" when they are suffering violent pain or extreme anguish. The phrase "the agony of the death-struggle" is often used.

AGORAPHOBIA.—This term is applied to an exaggerated and unhealthy fear of open places or spaces. The word literally means "fear of a market place." (*See also* CLAUSTROPHOBIA.)

AGRAPHIA.—This is a condition in which the patient is unable to express ideas in writing. In certain forms of this trouble, the patient may be able to write, but what he has written conveys no meaning whatever. Sometimes the patient may be quite unable to copy writing, but be perfectly able to write from dictation, while another form is loss of capacity to write from dictation.

AGUE.—An old-fashioned name for Malarial fever, in which there are always severe chills and sweatings and which recurs at regular intervals. Three hundred years ago England was full of "ague." (*See also* MALARIA.)

AGUE CAKE.—A chronic enlargement of the spleen which arises in diseases of malarial origin. The spleen may become so enlarged that it extends far down into the abdominal cavity.

AILING CHILDREN.—What a difference there is between the strong, noisy, boisterous, healthy child, brimful of energy and high spirits, and his poor little sickly and ailing brother or sister. The little mite may be suffering from anything or nothing. It may be a child who has had a bad start in life, perhaps by having been born before time, or by having severe attacks of diseases such as measles or scarlet fever at an early age, and that the early weakness will be grown out of and the child will later on be as strong as the others; or it may be that the little unfortunate has been born with some defect, which will always be a handicap, or has suffered from some such disease as rheumatic fever, tuberculosis or typhoid fever, which will leave it weakly in afterlife. Whether the cause is permanent or temporary, however, the ailing child should never be neglected. Treatment in early life may turn the weakling into a strong man or woman, or if this is not possible may prevent him from having to lead the life of an invalid.

It would seem to be unnecessary to urge parents to do their best for their children, but the fact remains that the parents who are accustomed to the child and see it every day may be the last people to notice when it begins to go downhill, and attention may be drawn to the child's condition first of all by some relative who sees it after an interval, or by the neighbours or the school teacher. Then the mother will remember that of late it has been listless, not playing with the others as it used to do. Perhaps it has taken to merely "pecking" at its food or it may have begun to crave for unusual things to eat such as pickles, or a lot of sweets. It may have grown thin or it may have grown fat, colourless and flabby. Its nature may have altered and it may have become nervy, fidgety, bad-tempered and inclined to cry on the slightest provocation, or it may have become heavy, sluggish and stupid. There may be nervous upsets such as bed-wetting, sleeplessness, or night terrors. Furred tongue, bad or sweet-smelling breath and a large round sticking-out stomach, are all symptoms of health that is not quite as good as it should be. If any of these things are noticed to last for any length of time in a child, it should be taken to the private or school doctor to be examined. "A stitch in time saves nine" is very true of health. Adenoids may cause deformities in the nose and chest that will not mend if they are left too late. A tubercular joint has a very good chance of getting strong enough to be useful if treated at an early stage. An unstable nervous system may be toned up so that hysteria and neurasthenia are avoided in later life. A little prevention is worth a lot of cure. A special supplement tells about *Child Welfare* work which is being done at clinics and at school and home.

AILMENT.—A disease, sickness, or complaint.

AILUROPHOBIA.—An unnatural fear of cats. This is different from the easily understandable dislike of the domestic cat found in people who get asthma when they are in the same room as a cat.

AINHUM.—This is a disease of the dark-skinned races who live in warm

countries; it is limited to the toes, and characterized by their becoming diseased and dropping off of their own accord.

It usually commences as a "chap" on the inner side of one of the little toes where it joins the foot. The chap gradually extends and deepens, the toe swells, and its appearance is as if it had been tightly tied round with string. The bones melt away, and the flesh changes to fat. Sometimes the furrow becomes infected with germs, and festering takes place. In time the "stalk" of the toe becomes so slender that the toe dangles about, causing pain and inconvenience in walking. It is then usually chopped off by the patient, and the wound rapidly heals over.

The little toes, one or both, are usually affected, but the others may be attacked. Ainhum may run its course in a few months; usually it goes on for years, perhaps as long as ten. There are no general symptoms. Nothing is definitely known about the cause of this disease, but it is generally thought that it is caused by a germ that gets into the tissues by means of a crack in the skin.

The treatment consists in amputation of the affected part.

AIR.—The air or atmosphere consists of a mixture of gases: 77 parts of nitrogen, 23 parts of oxygen and a trace of carbon dioxide. It also contains traces of ammonia, argon, nitrites and organic matter, as well as a varying amount of water vapour. The purest air is to be found on the tops of mountains or far out at sea. In towns the air is always polluted by gases given off from factories, drains, coal-heated houses, etc., and bad ventilation encourages the growth and spread of germs which produce disease.

The air is laden with particles of dust which contain specks of coal dust, hairs, pollen, splinters of wood and many other substances all of which are injurious to the lungs. When polluted air is constantly being breathed, especially if there is an excess of dust as there is in mining districts, it is likely to cause inflammatory disease which may possibly lead to tuberculosis.

AIR-CUSHION.—An air-cushion is usually made of soft india-rubber, and can be inflated to any degree required. The round air-cushion with a hole in the middle is the most useful in cases where a patient requires support without disturbance to a wound, such as a carbuncle on the back, boils, etc.

AIR HUNGER.—Difficulty of breathing or dyspnœa when a person gasps for breath is referred to as air hunger. The condition is usually due to heart disease. (*See also* Dyspnœa.)

AIR-SWALLOWING.—*See* Aerophagy.

ALBINISM.—Albinism is a condition in which a person or animal is born without the usual colouring matter in the skin. The hair is quite white and the eyes are pink. Every person who has to do with the breeding of small animals will probably be familiar with albinos, which turn up from time to time in litters of rabbits, rats, mice, etc. But there are also human albinos as well. In most cases of albinism, however, it will be found that the parents or other ancestors have shown a similar absence of colouring matter. The condition lasts throughout the lifetime. Usually the eyes of an albino are very weak and they have to wear glasses of a special kind.

ALBUMIN.—Albumin is the chief substance found in the tissues of human beings. It contains carbon, hydrogen, nitrogen, oxygen and sulphur. The white of an egg (called albumen) is largely composed of albumin.

ALBUMINURIA.—When albumin, which is an important substance present in the human tissues, appears in excess in the urine, the patient is said to have albuminuria. Its appearance may mean very little if it is temporary and due to faults of the diet or to a feverish condition, but it is also a symptom of disease of the kidneys, and its presence should always lead to a thorough investigation. In pregnant women especially, the presence of albuminuria should always be looked upon as a warning that there may be a danger of the serious condition known as eclampsia or "fits" arising, and for this reason the urine should be regularly examined during pregnancy.

Albuminuria occurs without any apparent reason in children, but they usually grow out of it. There may also be a considerable amount of albumin present in the urine of athletes directly after strenuous exercise. This has no significance.

Many cases of albuminuria are first discovered when the patient submits to examination for life insurance, to which it is usually a bar, owing to the serious outlook regarding a long life for the person with a chronic kidney disease such as Bright's disease. A simple test for albuminuria may be

carried out at home. A little urine should be boiled in a test tube. If it becomes cloudy add a few drops of vinegar or acetic acid, when that part of the cloudiness which is due to phosphates will disappear and the urine will become clear unless albumin is present, in which case a visit should be paid to a doctor.

ALCOHOL. — The "alcohol" which is commonly referred to, is one of a large group of chemical substances known as the alcohol group. Many of these are produced by the fermentation of sugary fluids, ethyl alcohol (alcohol) being much the most important. A simpler member of the same series is methyl alcohol, which is obtained by distilling wood, and is called wood alcohol or wood spirit. It has similar actions to alcohol, but in human beings is apt to produce fatal and serious results from a single dose. Blindness is not infrequently caused thus.

If a sugary solution is fermented with yeast, as is done in the making of beer and wine, the fermentation continues until the sugar is practically exhausted or until the percentage of alcohol in it has risen to about 12 per cent., at which strength the yeast becomes inactive. This means that any natural fermented liquor contains a dilute solution of alcohol. Wine which is maturing may be a little more concentrated. Further distillation of such a solution of alcohol by the proper method results in the production of pure or rectified spirit (90 per cent.), which in turn may be entirely freed from the remaining water and *absolute* alcohol is obtained. Distillation of fermented liquors is the essential feature of the production of strong liquors such as whisky, brandy, rum, gin or vodka. The flavour depends upon the presence of various other substances which are present together with the alcohol.

When it is pure, alcohol is a colourless liquid with a faint and fleeting odour.

ALCOHOL. ACTION ON MAN.— In dealing with the action of any drug on living tissues, its strength at the point at which it acts is very important. Strong alcohol used locally on any particular spot is capable of producing great irritation and damage. This property may, however, be used for hardening the skin, and also as an antiseptic since it will kill bacteria. The drinking of strong liquors is liable to lead to damage of the delicate lining of the stomach unless this be protected by the presence within it of other liquids or solid food. It is also associated with a violent burning sensation both in the mouth and in the gullet, as well as in the stomach. This may vary from the pleasant warming sensation which makes for good fellowship, to a severe pain. Different individuals vary considerably in the way they are affected by strong liquors, and many suffer from a severe inflammation of the stomach after small amounts of alcohol which do not affect others. This ability to tolerate alcohol or "hold one's liquor" may be lost during or after an illness.

The local irritation caused by drinking strong liquor leads to changes in the body which may not appear to have any connection with it, such as the raising of the blood-pressure, or the quickening of the rate of breathing. The administration of alcoholic stimulants is thus frequently useful in attacks of fainting, where both the blood-pressure and the breathing are impaired. Other irritants, such as smelling-salts (sal volatile), serve equally well.

Drinking dilute alcohol induces a feeling of warmth and well-being, and a marked flushing of the face. Not infrequently gas contained in the stomach is also released and allowed to escape by the mouth. These combined actions are known as a carminative effect, and are due to a combination of factors. The most quickly acting cause is the expansion of the blood-vessels, which expansion is directly produced by the alcohol. It may be caused indirectly by the irritation to the nerves of the stomach. The "hiccough" is caused by the local effect on the muscles of the stomach causing them to relax. As the upper opening, or sphincter of the stomach, is normally closed, alcohol, by relaxing them, causes them to open and allows the gas to escape. This latter action is used in medicine, and also to relieve the feeling of excessive fullness after a heavy meal by the taking of a small amount of concentrated liquor such as port or liqueur.

Alcohol in the stomach also causes an abundant production of the gastric, or digestive juices, which property is valuable in cases where these juices are scanty and poor owing to fatigue, exhaustion, general weakness or excitement. Strong solutions,

however, may themselves diminish the juices and should not be taken on an empty stomach.

Alcohol is rapidly absorbed into the blood-stream, and in addition it is unusual in that it passes very readily from the stomach itself into the blood-stream, since most substances are absorbed from the intestine. Substances dissolved from alcohol are also absorbed more quickly than normal. In the blood-stream it is rapidly carried to all parts of the body and is almost entirely consumed, by being burnt up into energy, this taking place chiefly in the muscles. Alcohol is like sugar in that the tissues may consume it without any preliminary change.

Alcohol supplies energy to the body and may thus be considered a food. Unlike other foods, such as sugar, alcohol must be used at once and cannot be stored. In a starving animal which is drawing on its resources of fat or other tissues in order to live, alcohol can save this tissue by supplying the necessary energy. An animal kept on a diet which is not enough for its daily needs will lose weight, and this may be prevented by the addition of alcohol, so that in certain cases alcohol may be regarded as a food. It is extremely easily made use of by the body, even more easily than sugar, but it cannot be stored.

Since it is very rapidly absorbed, it can be used without the expenditure of any energy by the body itself; it is valuable therefore in states of great exhaustion, associated with starvation, and in diseases in which the digestion of food is greatly impaired. The addition of alcohol to an otherwise generous diet leads to the conservation of the other food, and in consequence an increase of weight. It is thus used associated with strong sugary solutions to fatten thin people; especially popular is the drinking of stout for this purpose. Alcohol only supplies energy to the body, and as this requires many other things in order to function properly, the use of alcohol in place of natural food may lead to a virtual starvation and consequently to grave damage. This is one of the chief causes of ill-health in persons taking large doses of alcohol, and is probably more important than the presence of the alcohol itself. Only a little alcohol (2 per cent.) escapes being used up by the tissues, unless excessive quantities are taken. Moreover, the tissues learn to burn it at a more rapid rate, and thus tolerance is obtained. In healthy people this tolerance may be very large, but is less in sickness.

When alcohol is present in the blood-stream it tends to accumulate more rapidly in fatty tissues which are well supplied by blood, than elsewhere. Its greatest effect is noticed on nerve tissue, and as the largest collection of nerve tissue is usually situated in the brain, alcohol produces its chief effects there, which are to delay and diminish its response to stimuli. This action is termed *depressant.* Roughly speaking, alcohol depresses the nervous system in a descending order, the more lately acquired faculties being more easily disturbed than the older ones. To this it must be added that alcohol, in common with other drugs, especially picks out that part of the brain which may be weak, either by inheritance, disease, damage or fatigue. It is untrue to say that alcohol depresses the highest faculties first, since these are not necessarily the same as those most lately acquired. Where education has been continuous and beneficial this might be true; but where, however, the process of education has been interrupted, this may actually be the reverse.

One must take the action of alcohol on the brain to be a gradual undermining of its educational processes, those very recently acquired, or only weakly established (the actual time involved in the learning is most important) being wiped out first. Thus some people who are quite nice when sober, have their social manners removed by alcohol, and under its influence become beastly. On the other hand, those possessing a sound continuous education such as is given at school, and who have continued their moral and mental development without break in their later life's work, gaining good control over themselves, never become really objectionable in their behaviour, apart from an increasing stupidity and lethargy.

"Taking wine like gentlemen" is a phrase which has a real meaning. Unstable folk, who because of undue sensitiveness have become reserved and shy, may lose this control in the early stages of the depressing action of alcohol, and may therefore appear to become greatly stimulated. Such people are dangerously affected by alcohol, since

this loss of control is associated with a feeling of greatly increased powers. They are in consequence very liable to form the habit of using alcohol for this purpose, and thus become drunkards. Others who are tired and worried by business affairs get the fatigued part of their brain depressed, and in consequence they become relatively cheerful under the influence of quite small doses of alcohol. In this class alcohol may be a real service provided that it is taken in strict moderation and under suitable circumstances, in that it allows an overtired brain to rest in such a way that the untired body may obtain some healthful exercise

If the brain is damaged by disease then alcohol may have extremely marked effects; this is very well seen in epilepsy (fits), owing to the ease with which observations can be made. Such people should avoid its use altogether.

Alcohol is often regarded as a stimulant, and at first sight a superficial study seems to support this view. Very careful observations, however, have shown that from the very commencement of its action some control over the working of the body becomes slackened, especially of the finer perceptions, both of a mental and a muscular nature. Its stimulant effect therefore, can be likened to the removal of control of the mental brakes. In those people where the brakes have not been well-developed, or are overstrained by shock or worry, their removal may take place quite early, and the person becomes excessively excited. In others the brakes are paralysed along with the rest of the mental processes and they become sleepy and stupid. A further conclusion of the greatest importance is, that while the removal of the brakes may be harmless, or even beneficial, as on an occasion such as a convivial banquet, it may be very dangerous in anyone who is doing something which requires continuous and accurate judgment. In such persons as drivers of any sort of vehicles, workers amongst large machinery, etc., the loosening of the control over the nerves and muscles due to alcohol will be fraught with great danger. For this reason one of the Scandinavian countries forbids anyone driving a public conveyance or motor-car to take any alcohol for several hours beforehand. This prohibition, as can be seen, rests on a sound scientific basis.

It is often stated that alcohol shortens life, and leads to the degeneration of the race. Statistics show without doubt that heavy drinkers up to the age of 70 have a poorer expectation of life than the rest of the population. Over this age they appear to have a much better one. On the other hand moderate drinkers appear to have a slightly greater expectation of life at all age periods up to 70, as compared with total abstainers. From these very recent studies it is safe to conclude that alcohol in moderate amounts has no effect at all on the duration of life, either beneficial or otherwise.

It is believed that alcohol predisposes to disease, especially infection, and it is well known that alcoholics usually die when they are attacked by pneumonia. The probable explanation is that alcoholics do not take sufficient care of themselves, especially in regard to their diet, and that they become in consequence of this more prone to illness.

ALCOHOL, ITS EFFECTS ON APPEARANCE.—Alcohol in any strength has certain definite effects on the appearance. It is not the purpose of this article to discuss the remote effects of chronic alcoholism, the terrible mental and bodily changes which inevitably occur, but to indicate the first alterations produced by even a small quantity consumed regularly.

Alcohol has a definitely harmful effect on the complexion. The pleasant feeling of warmth it gives to the skin is caused by distension of the blood-vessels; if these are frequently stimulated they appear to become tired, and remain distended, thus causing an unbecoming permanent flush. Accompanying this, the over-feeding of the skin associated with the excessive blood supply causes an increased working of the oil glands and the sweat glands, and also leads to thickening of the skin. So that in addition to redness, the skin becomes coarse and greasy, with marked pores, which no amount of make-up will effectually conceal. The eyes lose their clear, healthy look (they, too, have an increased blood-supply), and become dull and bleared.

Alcohol, because it is a rapidly and easily digested food, rapidly adds to the weight of the body. It produces fat inside and out Add to these changes the look of mental dullness so often seen, even at this stage,

and it will be admitted that the appearance will not be improved by its regular use.

ALCOHOLIC NEURITIS.—*See* MULTIPLE NEURITIS.

ALCOHOLIC POISONING.—A very large dose of alcohol leads to such a deep slackening of the working of the nervous system that finally the vital centres controlling the breathing, the beating of the heart and the rate of the blood in the blood-vessels fail, and the person may die. Usually the immediate cause of death is failure of the breathing. Death may take place also as a consequence of the exposure and loss of body heat in those cases where the intoxication has taken place out of doors, or in an insufficiently heated building. In these cases pneumonia is a common end. Occasionally the breathing of vomited material, due to the person lying on the back, may cause death.

ALCOHOLIC POISONING, CHRONIC.—It is generally recognized that the habitual consumption of excessive amounts of alcohol is due to some failure, or imperfect development of the mind, in that the person is unhappy when in a normal condition and in the usual environment. In simple cases drinking alcohol is a method of temporarily escaping reality. Constant running away from reality, or failure to adjust oneself to the circumstances of one's life, together with the presence of a drug which constantly lowers the vitality, especially when the mode of living is imperfect, leads in many cases to complete mental and physical breakdown. There are numberless symptoms described as associated with such conditions, depending on the particular circumstances of the case. In physically weakly people large continued doses of alcohol lead to an early failure of some function necessary to life, and death results. It must be stated, however, that the physically strong do not seem to become directly poisoned by even very large doses of alcohol providing they lead a very active, healthy life.

ALE.—An alcoholic beverage brewed from hops and malt. It contains from 3 to 7 per cent. of alcohol.

ALEPPO BUTTON.—Also known as Oriental sore, Oriental boil, Delhi boil, Baghdad sore, and by other names, according to places in which it is found. It begins as a pimple which spreads and breaks down into an ulcer. This heals very slowly, usually taking from six months to two years to clear up. As a rule a few sores make their appearance, often leaving unsightly scars, so that if the disease occurs on the face there may be much disfigurement.

It is caused by infection with a parasite, and the disease is probably spread by a special sort of sand-fly. One attack of Aleppo Button usually gives lifelong protection against any subsequent attack. Treatment is usually successfully carried out by injections of sodium antimony tartrate.

ALEUKEMIA.—Deficiency in the proportion of white cells in the blood.

ALIMENTARY CANAL.—The passage through which food passes from the mouth to the anus or lower opening of the bowel. Its parts are called, in the order in which they occur, the mouth, pharynx, œsophagus (or gullet), the stomach and pylorus, duodenum, jejunum, ileum (small intestine), cæcum and appendix, colon (large intestine), the rectum and anus.

ALIMENTARY SYSTEM.—The digestive tube which extends from the mouth to the anus is known as the alimentary canal or tract; but the accessory glands such as the salivary glands, the pancreas and the liver are also included in the alimentary system. (*See also* DIGESTION.)

ALKALI.—This term is derived from an Arabic word meaning soda-ash. Chemical substances which are alkalis include bicarbonate of soda, which is one of the most frequently used medicines in cases of acidity. When an alkali comes in contact with an acid substance, the two unite and neutralize each other; in other words, they form a salt substance which is neither alkaline nor acid.

ALKALINE POISONING.—Strong alkalis such as caustic soda, strong ammonia, etc., act as very corrosive poisons. Emetics should not be given, as the act of vomiting would only increase the irritation of the throat. While the doctor is being called, the patient may be given a small quantity of lemon juice or vinegar, in about half a glass of water. This may be followed by milk, white of egg beaten up with a little water, barley water, arrowroot or olive-oil To relieve pain in the abdomen and throat, hot fomentations should be administered and the patient should be kept as warm as possible. (*See also* FIRST AID SUPPLEMENT.)

ALKALOID.—Alkaloids are substances extracted from plants, which have a powerful action in one way or another. They are alkalis and are nearly all bitter to the taste. Some of our most powerful and useful drugs are alkaloids. A few of the more common ones are aconite,obtained from monk's-hood, atropine from deadly nightshade, cocaine from coca leaves, digitalin from foxglove, ergotin from rye, morphia, heroin and codeine from poppies, nicotine from tobacco, quinine from cinchona bark and strychnine from nux vomica seeds.

ALKALOSIS.—The chemicals in the body are either acids or alkalis and to keep the body in perfect health a definite amount of each sort is required. Alkalosis is simply the disordered state of the body in which there is too much alkali for the amount of acid in the blood. The condition is usually the result of taking large amounts of alkalis, such as bicarbonate of soda or magnesia, which are prescribed in large amounts in certain diseases of the stomach such as stomach ulcer, but it may also be the result of severe vomiting. It is found also in mountain sickness and heart failure, when it is due to lack of oxygen in the blood.

The chief symptoms are a feeling of uneasiness, headache, giddiness, loss of appetite, vomiting, twitching limbs, and coma. As soon as alkalosis is discovered to be present, all alkalis should be stopped at once, and sugar in the form of glucose should be given; at least 1 oz. in water three times a day. Glucose is very sickly to the taste, so if the patient is unable to keep down the glucose taken by mouth, it may be given by injection into the bowel. Calcium may also be prescribed.

ALLERGY.—This is a condition present in certain individuals which is best described as a chemical "idiosyncrasy." Its manifestations, such as swelling and itching, and bodily discomfort, are often brought about by a particular article of food, the most common being fish, eggs, milk and wheat. If, for example, after a meal all of the participants become ill, something was probably wrong with the food; but if only one person becomes ill, with all eating the same food, something was probably wrong with that individual. In the first case, the condition is food poisoning; in the second case, food *allergy*. But allergy is not necessarily associated only with a disposition to being upset by certain foods. *Hay-fever*, in which the person is upset by the irritation of certain pollens—timothy grass being the most common—is a form of allergy; and so is *asthma*, which, however, may often be brought on by certain articles of food; one person may get an attack of asthma from the same article of food, that another allergic person may get an attack of nettle-rash (urticaria). The real cause of allergy is still obscure, but it can be controlled by the avoidance of the upsetting articles of food, and by injections of adrenaline, ephedrine or peptone. (*See also* ANAPHYLAXIS.)

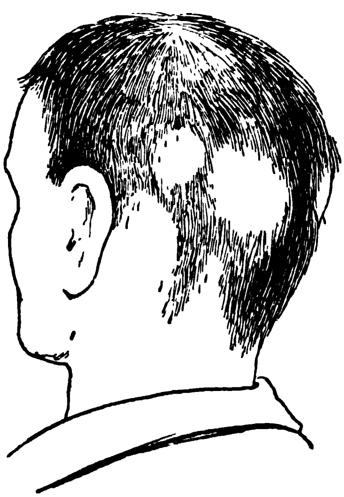
ALMOND.—Almonds are among the most nutritious members of the nut family and contain a large percentage of highly digestible fat, as well as protein and carbohydrate. One great objection—shared with most nuts—is the large amount of cellulose they contain, which makes careful chewing necessary. A very pleasant way of eating almonds is to grind the nuts up and make them into biscuits. The bitter almond contains an oil which is quite distinct from the oil obtained from sweet almonds. Ordinary almond oil is a very pleasant substance and is often used in ointments. The oil of bitter almonds is used in small quantities as a flavouring in cakes and confectionery. Prussic acid is produced from the oil of bitter almonds.

ALMONDS, BITTER. POISONING BY.—The patient should be roused by dashing cold water on his face and chest. An emetic of mustard and water should be given. If the breathing is difficult, artificial respiration should be started. Some stimulant, such as brandy or whisky, may be given and the patient should be kept warm with hot-water bottles, and the doctor called for. (*See also* EMETIC, ARTIFICIAL RESPIRATION.)

ALOES.—Aloes is one of the most popular drugs used for the purpose of purging the bowels. It is included in many patent medicines and pills, acts chiefly on the lower bowel and is very useful in the treatment of chronic constipation. It is not a suitable drug to give to pregnant women as it has been known to produce abortion. It is, indeed, popularly thought among many ignorant women that all they have to do to procure abortion in the first months of pregnancy is to take stiff and purging doses of

aloes. This is of course mere folly. If a pregnant woman is sound and healthy, no amount of aloes and salts will do more than make her miserable and uncomfortable, to the detriment of her health. Aloes alone cause severe griping pains, so they are most often used in combination with some such drug as belladonna or hyoscyamus.

ALOPECIA AREATA.—This is the term given to the development of small rounded areas on the scalp, which have become completely bald. These sometimes increase in size and run together until the whole scalp appears absolutely hairless. The cause of this disease is not definitely known. The recovery from this condition is usually slow, and if occurring in elderly persons, will probably take longer.



Alopecia Areata

All forms of treatment aim at stimulating the scalp in some way or another. The scalp should be kept thoroughly clean and sulphur ointment should be rubbed in every night. Other remedies are turpentine, vinegar, paraffin oil, etc. It should be remembered that the rubbing necessary for the application of these remedies is probably the most important part of the cure. Applications of ultra-violet rays have sometimes proved of great benefit in the treatment of Alopecia Areata.

ALTERATIVE.—Medicine that alters the processes of nutrition and restores, in some unknown way, the normal working of an organ or of the system. The most important alteratives are arsenic, iodine, mercury, sulphur and gold, etc.

ALTITUDE.—By altitude is meant the height of a place above the level of the sea, which is the standard by which height is measured, since the sea is the one thing which is the same height all over the world. Ground at 1,000 feet of altitude, meaning a thousand feet above the sea-level, is called a mountain. In some diseases a high altitude is a great help towards a cure owing to the purity and lightness of the air at high altitudes. Mountain air is also frequently ordered for convalescents. Consumptives especially benefit by a long residence in mountain air, and for this reason are very often sent to Switzerland where even the land in the valleys is at a considerable height above the sea-level. It may be that the air is purer on the heights and more free from dust and germs which are definitely bad for people with weak lungs. In this country there are many health resorts situated at an altitude of from 400–800 ft. which are good for general convalescence. Amongst these are Harrogate, Malvern, Ilkley, Buxton, Matlock, Peebles, Llandrindod Wells. Nowhere is height so important to health as in very hot countries such as India and the Malay States. In these countries there are hill stations high up in the mountains to which people from colder climates can go every year for a period of respite from the great heat which is not natural to them.

Although for almost all complaints hill air is good in convalescence, it must not be forgotten that a high altitude is not good for people with heart trouble, and they should remain below 400 feet.

ALUM.—Alum is an astringent which is often used as a throat paint. Powdered alum applied to a cut will often stop bleeding. One or two teaspoonsful dissolved in a pint of hot water may be used as a vaginal douche in cases of leucorrhœa or "whites." A solution of alum is useful to destroy slugs, snails, and their eggs without harming the plants.

ALVEOLAR ABSCESS.—*See* GUMBOIL.

ALVEOLUS.—The bony socket in which the tooth is fixed is known as an alveolus. A gumboil is known as an alveolar abscess and is usually due to a decayed tooth.

AMAUROSIS.—The technical name for part or total blindness. (*See* BLINDNESS.)

AMAUROTIC CAT'S EYE.—This is the name given to a condition of the pupil of the eye in which it glows like a cat's eye in the dark. It occurs when the eye is pushed forward as, for instance, by a tumour. The light rays from the eye diverge instead of being focused to point straight in front of the pupil. "Cat's Eye" is also present in the eyes of albinos, due to lack of colouring matter; also when the lens has been removed.

AMBIDEXTROUS.—A person who is able to use both hands equally well is said to be ambidextrous; from the Latin words meaning "both" and "hands."

AMBLYOPIA, or AMAUROSIS, with no ophthalmoscopic changes.—For centuries the term Amblyopia has been used to mean defective vision, and Amaurosis blindness, "for which there is no recognizable cause in any part of the eye." It has been happily described as a "disease in which the patient sees nothing and the physician sees nothing!" The latter term is now practically obsolete, and the ophthalmoscope has curtailed the number of diseases formerly classed as amblyopia; but this expression, though loosely employed, is convenient to describe cases in which the ophthalmoscopic changes are insufficient to account for the symptoms, or which make their appearance later.

The causes suggested are very numerous, the most important being (excluding diseases of the eye and neighbouring parts) toxins such as tobacco and lead; functional or reflex; and defective development. In toxic amblyopia, the poison may be introduced from without, or manufactured in the body. Tobacco and lead are by far the most important in the first group, though quinine, sodium salicylate, morphia, and other drugs are sometimes the cause. Body toxins, which cause more passing and less characteristic symptoms, are chiefly uræmia; megrim, caused by digestive disorders; and, more rarely, fevers, such as malaria. (*See also* Blindness and Defective Sight.)

AMBRINE.—A dressing for burns and wounds. It is composed of a mixture of paraffin and resin.

AMBULANCE.—A vehicle for conveying injured or ill persons. (*See also* First Aid Supplement.)

AMENORRHŒA. — This means the absence of the "courses" or menstrual flow during the period of life in which they should be present. (*See also* Menstruation.)

AMMONIA.—A strong, colourless, pungent gas which is very easily dissolved in water. Preparations of ammonia are used extensively in medicine as heart stimulants, gastric stimulants, and also in cases of headache and hysteria, etc. It is also useful in bronchitis. Aromatic spirit of ammonia or *sal volatile* is used in many forms of smelling-salts. Household ammonia is used for many domestic purposes, but it should on no account be taken internally. Ammonia is a very good application in cases of insect bites or stings.

Ammonia Poisoning.—Ammonia acts as a corrosive poisoning and breathing its vapour has been known to cause death. The air passages become inflamed and great difficulty in breathing may result as a consequence. No emetic should be given. Lime juice or vinegar in half a glass of water followed by bland substances such as milk, egg white, arrowroot, or olive-oil may be administered. The patient should be kept warm and the doctor called for.

AMNESIA.—This is the medical name for loss of memory.

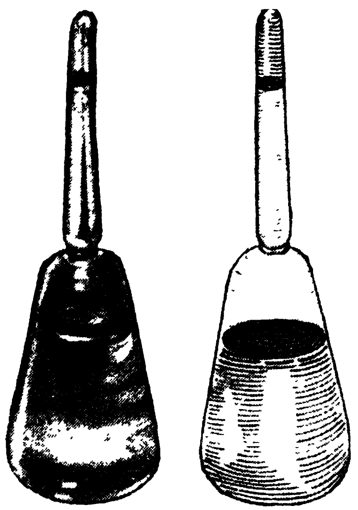
AMNION.—The amnion is the bag or sac in which the fœtus or unborn child is enclosed. It contains one or two pints of fluid in which the child floats.

AMŒBA.—A single-celled, colourless, jelly-like germ found in the sea and in fresh waters. This single cell represents the earliest and simplest form of animal life, and as such may be regarded as the original ancestor of man. Certain forms of amœbæ cause diseases in man. The form of inflammation of the bowels called dysentery is due to an amœba.

AMPOULE. — An ampoule is a small, sealed glass capsule. Ampoules are used for holding small measured quantities of drugs, vaccines or serums sterile and ready for use.

AMPUTATIONS. — By amputation is meant the cutting off of a limb or other part of the body. Amputations have been called the last resort of the surgeon, and are never carried out nowadays unless the surgeon has found himself unable to cure the disease which makes the amputation necessary, or unless to prevent serious and possibly fatal complications arising from the disease which

is present. For instance if an arm or leg becomes gangrenous or "mortifies" nothing will cure it, and it will rapidly spread and kill the patient unless the limb is speedily removed. Amputations are much less common to-day, except in time of war, than they were a generation or two ago. In performing an amputation a surgeon always preserves as much of the limb as he can, but at the same time he must consider how to make the stump which results as suitable as possible for



Ampoules

having an artificial limb fitted on to it. (*See also* ARTIFICIAL LIMBS.)

AMYL ALCOHOL.—A form of alcohol known as fusel oil or potato-starch alcohol. It was formerly used to adulterate whisky.

AMYL NITRITE.—A clear, yellowish liquid, with a penetrating odour. It is a very important drug in the treatment of heart disease as it has a stimulating effect on the heart's action. Amyl nitrite is usually supplied in small capsules which can conveniently be carried and used by crushing in a handkerchief when necessary. (*See also* ANGINA PECTORIS.)

AMYLOID DISEASE.—This name is given to a condition in which a starch-like substance is found in the tissues owing to disease.

The process affects the tissues of the blood-vessels of various organs, especially the liver, spleen, kidneys and bowels, and is connected with chronic suppuration in the body. Another name for this condition is lardaceous disease. (*See also* BRIGHT'S DISEASE.)

ANACIDITY.—The lack of normal acidity; subacidity. (*See also* ALKALOSIS.)

ANAL.—Anything to do with the anus, or lower opening of the bowel, is described as anal.

ANALGESIA.—By analgesia is meant insensibility to pain. A remedy that relieves or deadens pain is called an analgesic. (For a description of various analgesics *see also* ANÆSTHESIA.)

ANÆMIA or BLOODLESSNESS.—Anæmia may mean a deficiency of blood as a whole in the body, or it may be a deficiency of the number of red cells in the blood, or of the red-colouring matter (hæmoglobin) of the blood. About one-twentieth of the whole weight of the body should be blood.

Anæmia may be local, e.g. affecting a small portion of the body only, when it is known as *ischæmia*, or it may be general throughout the whole system when it is divided into two main types—*primary anæmia* and *secondary anæmia*. A primary anæmia is one in which there is no obvious cause, while a secondary anæmia is one which follows some obvious reason such as excessive bleeding from an accident, or prolonged loss of blood in small quantities such as occurs from piles, stomach ulcer, etc. The anæmia may be due to a failure to manufacture enough blood, to increased use of it in the body, or to loss by bleeding.

Anæmia is not necessarily indicated by general pallor. The Latin races are paler than the Anglo-Saxons. People who work with lead, such as painters, and addicts of drugs such as morphia, may all have a permanently pale skin with no anæmia.

Local Anæmia or Ischæmia.—All the tissues of the body are supplied with blood which is pumped round from the heart. The supply to the various parts can be regulated by the contractions of the arteries according to the needs of the parts. Under certain conditions it may happen that too much blood enters one area so that other parts suffer from a shortage. This occurs in a state of shock, when the blood remains in the smaller blood-vessels of the abdomen and the brain may have too little blood, with the result that the individual becomes unconscious. Another form of local anæmia is seen in Raynaud's disease, in which the walls of the arteries of the extremities, e.g. the fingers and toes,

contract and do not allow the blood to enter the parts.

Primary Anæmia.—This is quite a common condition and in a mild form is manifested by a feeling of being tired and out of sorts. The colour of the skin of the face is no guide, but the inside of the lips and of the eyelids is paler than in a normal person. Such patients catch cold very easily and are more liable to complications, such as the infection of the sinuses of the nose, influenza, etc.

If such a person becomes seriously ill, he (or more usually she) may die owing to a "lack of resistance." They also suffer from a bad circulation, that is to say, the hands and feet are usually cold, and may also be moist and clammy. They feel the cold in winter, and are liable to chilblains. The blood is of poor quality, and is lacking in the hæmoglobin which carries the oxygen; the muscles are under-nourished, and in particular the heart muscle, so that the pump which keeps the blood circulating throughout the body is poor and is not doing its work efficiently. When the anæmia is more serious the patient has some definite discomfort which usually shows itself as indigestion. The appetite is capricious, and there are longings for unusual things, especially sharp and tasty things such as pickles. Constipation is common. A general dropping of the organs, known as visceroptosis, is sometimes met with.

The weakness of the heart muscle may lead to palpitation and obvious pulsation in the veins of the neck; breathlessness on going upstairs, etc. Menstruation is either more free than normal, or very scanty. Any small scratch or cut may be difficult to stop bleeding. Clotting of blood in the veins (thrombosis) is a real danger, and is most often seen in the leg, though it may occur in the veins of the brain. The defective supply of blood in the brain often results in a kind of neurasthenia; the patient worries over trifles, sudden noises make him jump, he is unable to concentrate or to stand prolonged mental or physical strain.

Chlorosis.—A stage further than the degree of anæmia described above. The skin may assume a characteristic greenish complexion, which is most marked in brunettes. The body as a rule is well nourished, and this, together with the peculiar complexion, form a characteristic picture. The condition used to be far more common in women than in men, chiefly owing to the fact that the women led a more sedentary life. Owing to the change in the mode of living among women the disparity is becoming less marked, and the disease is now a rare one.

Causes of Anæmia.—It is most common in girls, just after puberty. It seems to be associated with the beginning of the menstrual periods in women. It is more common among those who work under poor conditions and have insufficient food. Lack of exercise causes the waste products to be retained in the blood. These act as a poison to the red corpuscles and reduce their power of taking in oxygen.

Sometimes atmospheric conditions, such as living at high altitudes, may produce an anæmia due to the fact that the oxygen leaves the blood-cells too readily. After a time the red cells increase enormously in number; and whereas the average number of red cells in a cubic millimetre of blood is five millions; under these special conditions the number may increase to ten millions; but the hæmoglobin in each cell is much diminished. (A cubic millimetre is the size of an ordinary pin's head.)

Various chronic forms of poisoning such as chronic constipation, chronic rheumatism, etc., are often associated with the so-called primary anæmias.

Pyorrhœa is due to a germ which has a marked blood-destroying action, and therefore causes anæmia.

Treatment.—If there is any likelihood of any of the above causes being present, they must of course be treated adequately. General hygiene is important; proper ventilation of the bedroom at night, so that the air breathed out is not allowed to accumulate. Damp should be avoided as it favours rheumatism. Clothing should be sufficient for warmth, but should not be excessive. Porous clothes which provide sufficient warmth are the best as they allow the skin to work freely and to regulate its own temperature. Diet must be non-irritating so as not to increase the indigestion which is usually present. Meals must be regular and no food must be taken between meals. Fluids should not be taken with meals, but a bland fluid such as water should be drunk half an hour before a meal. Tender meat rather under-done and finely minced is very

useful. The amount of sleep required by the patient depends on the severity of the case; where there is any failure of the circulation the patient snould remain in bed altogether, until these symptoms disappear. Where there are signs of mental irritability some sedative, such as bromide or aspirin, may be necessary at first. Later on exercises, which must be graduated and should always stop before producing fatigue, are very useful, since they assist the circulation generally. The exercises increase the activity of the skin and tone up the whole body generally. (*See also* SUPPLEMENT ON EXERCISE.)

Drug Treatment of Anæmia.—Iron is the most important remedy in this disease. An excellent form is as Blaud's pills, which are not a patent medicine, but an old and valuable formula. During the first week one pill is taken three times a day; for the second week two pills, and in the third three pills three times a day. It is most important to go on taking the iron for at least three months, and if necessary to resume it afterwards in smaller doses as recurrences are so common.

Arsenic, in the form of Fowler's solution, can be combined with the iron with advantage. It should be given in small doses, as large ones may have a destructive effect on red blood-cells.

Hæmoglobin extracted from bullock's blood is a valuable form of iron. The chlorophyll (green colouring matter) of plants is also a form of iron which can now be obtained in tablet form and has produced some very good results.

Lipoids, e.g. substances which act in the same way as fats, but which are chemically quite different, are obtainable from red blood corpuscles, and can be given by mouth or by injection. At present this treatment is rather expensive, but good results are obtained. Colloidal forms of iron and manganese suitably prepared, injected daily for a dozen times or so into the muscles or deeply under the skin will often cure the anæmia for several months. A second course will usually cure it completely.

In the case of children the injection method of treatment is not very suitable; but, on the other hand, they improve very quickly on simple medicines, such as preparations containing hæmoglobin or chlorophyll. Virol, which contains malt, bone-marrow and vitamins, is a great help. The child should have plenty of fresh air and plain food such as milk, eggs, butter, etc., and oatmeal in the form of porridge.

Secondary Anæmias.—Severe secondary anæmia may arise after the breaking of a large blood-vessel—as for instance during the course of a gastric ulcer, or when one has been involved in a road accident.

Symptoms.—Faintness and shortness of breath. Great pallor of the skin. There may be vomiting and even convulsions.

Treatment.—The treatment for secondary anæmia due to sudden severe loss of blood is to replace the amount of fluid in the blood-vessels as soon as possible. This is done by injecting the mixture of specially prepared distilled salty water called "normal saline" solution into the veins, the bowels, or giving it by the mouth. This restores the ordinary amount of fluid to the system and although it is not nourishing like blood it has the effect of keeping the heart working as if it were pumping blood.

Secondary anæmia also arises when the food-supply of the body is defective owing to some such condition as chronic and long-continued stomach trouble. After severe infections like typhoid fever, rheumatic fever, blood-poisoning, malaria, tapeworm, etc., and after poisons such as lead, mercury or arsenic, and debilitating diseases like Bright's disease and jaundice.

ANÆMIA, PERNICIOUS.—This serious disease of unknown origin is described in a separate article under the heading PERNICIOUS ANÆMIA.

ANÆSTHESIA.—By anæsthesia is meant the state of unconsciousness or insensibility to pain to which patients are reduced before a surgeon performs an operation on them. It may not be necessary to render the patient completely unconscious if only a small part of the body is to be dealt with, such as a finger or the opening of a boil, so that anæsthetics are divided into the two classes, *general* and *local*, according to whether the whole body is to be rendered insensible or only a small part.

Until about half-way through last century operations were performed on conscious patients and there are many old accounts of how dreadful this must have been, several strong men being sometimes required to hold the agonized patient down on the table while the operator continued with his job. Many



Surgical Operation in the XVI Century



[Courtesy of Princess Beatrice Hospital]

A Modern Operating Theatre

cases there were too of absolute heroism where operations were borne without flinching which must have entailed pain so great that none could contemplate enduring it nowadays. It was not possible, of course, to perform any of the delicate operations on vital organs that are now possible since the discovery of modern anæsthetics, beginning with ether and chloroform. Surgery was mostly a matter of cutting off limbs, "cutting for stone," bleeding and a sort of digging out of tumours. Naturally all sorts of ways were tried to deaden the pain by stupefying the patient. The ancient Greeks used nepenthe, and hyssop was offered to Christ on the Cross. Preparations of opium and "hashish" and similar drugs were tried, and often the patients were operated on when "dead-drunk." At a later period hypnotism was tried and was occasionally successful.

At the beginning of the nineteenth century Sir Humphry Davy, the great scientist, discovered that he could anæsthetize himself with nitrous oxide ("laughing gas"), but his discovery was not made any use of until fifty years later. In 1846, W. T. G. Morton first used ether in Boston, U.S.A., and in 1847 Sir James Simpson discovered the anæsthetic use of chloroform at Edinburgh. It was not, however, until Simpson administered chloroform to Queen Victoria at one of her confinements that general anæsthesia received the approval that made it so universal as it is to-day.

The drugs chiefly used to-day for general anæsthetics by the vapour method, are nitrous oxide, commonly called "gas," chloroform, ether, and ethyl chloride. Each will be mentioned in a short paragraph, but whatever the anæsthetic drug used the effects and method of giving it are much the same. There is first a semi-conscious state in which the patient feels the world swirling around him and in which he may talk, sing or laugh. With a skilled anæsthetist this only lasts a very short time, perhaps only seconds, and it is quite unnecessary for people to worry themselves, as they frequently do, by thinking that they may behave in an unseemly fashion or use bad language that they would not use in daily life. As far as the patient is concerned it is the usual experience for him to hear the anæsthetist say when he is commencing to give the anæsthetic some such phrase as "breathe deeply please," and then to know no more at all until some time after the operation is safely over and he is comfortably back in bed. In the matter of taking an anæsthetic well the patient can help the doctor considerably by overcoming his dread beforehand and going to the operation with a quiet mind. It is only reasonable to suppose that the patient who enters the operation room with a contented and resigned mind will be easier to anæsthetize than the patient who gives way to cowardice at the last moment and struggles against efforts to give him the anæsthetic, which will relieve him of his pain. In this connection it may be pointed out that when a death occurs while a patient is under an anæsthetic the law requires that there shall be an inquest, and inquests are reported in the newspapers, but no mention is made of the thousands of persons who undergo operations and survive the anæsthetic. Far more people are killed by accidents in the streets than by anæsthetics, and sensible people do not go through life dreading they will be killed every time they venture out of the house.

Nitrous Oxide, or laughing gas, is very popular in this country for short operations, such as the extraction of teeth, as it enables the patients to lose and regain consciousness in a very short time. The patient feels quite well after the operation and is able to walk home. It is chiefly used for dental work and other short operations. It has great advantages since it rarely causes vomiting, and there is no need for the patient to be watched for a long time afterwards. Nitrous oxide is a gas with practically no smell. It is sold in cylinders in liquid form, and by turning on the tap it is set free as a gas. It is then passed into a rubber bag and from this container is passed to a suitable mask or face piece, and thence to the patient.

An "ordinary" anæsthetic consists in giving the patient just enough gas to make him unconscious for about a minute. The mask is then removed entirely from the patient's face and the small operation is performed before the patient recovers consciousness. In some cases a condition of analgesia—in which the patient is not quite unconscious but does not feel pain—may be present for a good deal longer.

Ethyl Chloride.—This substance deserves to be specially mentioned. It is a fluid which

can be carried about in glass tubes. It turns into vapour very easily, but unfortunately has an unpleasant smell which can, however, be disguised to a certain extent by adding to it a scent such as eau-de-Cologne. Ethyl chloride is used for short operations such as the removal of tonsils in children, and is useful to add to the effect of nitrous oxide in adults, in cases where the latter gas is not sufficient by itself. It is found that people who lead an outdoor life, also very emotional people and chronic alcoholics, etc., become excited when they are given laughing gas, and ethyl chloride may be used instead.

Chloroform.—Chloroform is a sweet-smelling fluid. When it is used by itself it requires to be mixed with air. It can also be used together with nitrous oxide or ether. In England it is looked upon as a much more dangerous anæsthetic than ether, but in Scotland it has always been considered a safe anæsthetic, when given with plenty of air. It is particularly useful and safe in childbirth. In children there may sometimes be a delayed harmful effect on the liver, though the danger of this may be lessened by giving the patient glucose before the operation.

Ether.—Ether has lately become more popular than chloroform for general use because it is supposed to be safer. It stimulates the heart and causes the blood-pressure to rise, whereas chloroform depresses the heart and lowers the blood-pressure. It is, however, more irritating to the lungs and has a less pleasant smell than chloroform. The irritation to the lungs is lessened by giving the patient an injection of atropine before the operation, and the objection to the smell can be overcome by first giving the patient nitrous oxide or the scented form of ethyl chloride.

Pre-medication is a phrase meaning the giving of drugs for various purposes before an operation. One of the commonest drugs to be given before an operation is atropine, which diminishes the saliva in the mouth and prevents too much irritation of the lungs. Other drugs such as morphia and scopolamine, are sometimes used before the operation to quieten the patient's mind, and prevent any feeling of dread of the anæsthetic. The new drug nembutal (*see opposite*) is also used in this way. Lately it has become usual to make the patients go to sleep in their beds by means of some drug, so that they do not know of the journey to the operating theatre, and do not wake up or remember anything until several hours after everything is over.

The first attempts to achieve this were by injecting a mixture of ether and olive-oil into the bowel. This caused the patient to go to sleep in bed, and if necessary a small amount of ether was given in the usual way during the operation. Other drugs given thus are paraldehyde and more recently, avertin, which is of German origin and has proved very popular and successful in this country. The advantages of this method are that the patient is not frightened beforehand and will sleep for a longer time afterwards and so will feel less pain. There is less vomiting after the operation and less of the general anæsthetic is required during the operation.

There are, however, several disadvantages. More nursing will be required after the operation, since the patient takes longer to become conscious. He will not be able to clear his throat and lungs by coughing or spitting, and great care must be taken lest too much of other sedative drugs is given afterwards. It is often necessary to give morphia after these anæsthetics, as they tend to make the patients more excited than the ordinary general anæsthetic. The harmful effects on the lungs and liver are the same as with general anæsthetics taken by the old inhaling methods.

Nembutal and Pernocton are two new anæsthetics now being used. They can be given either by mouth or by injecting into a vein. They are also used to give the patient a good night's sleep before the operation, and bring him in a still drowsy state into the operating room, and thus are very useful for nervous and excitable patients. The latest anæsthetic is **Evipan** which is injected into a vein and is very safe and useful for short operations.

In cases of operations on the nose or throat, where the part of the patient which the anæsthetist usually requires for the purposes of giving the anæsthetic is occupied by the operator, it is necessary to give the anæsthetic by means of a tube passed down the nose or mouth into the windpipe. This is a very simple matter to perform and as the patient is always anæsthetized in the ordinary way to begin with, he knows nothing

about it, unless he has the curiosity to ask about it after the operation.

Local Anæsthesia.—The main difference between local anæsthesia or analgesia and general anæsthesia is that in a local anæsthetic only a portion of the body is rendered insensitive to pain, and the patient remains conscious. Large operations can be performed under a local anæsthetic, and this is sometimes done when the patient's heart is in a bad condition.

Drugs used.—Of the drugs used for local anæsthetics, cocaine is the best known, though nowadays it is only applied for operations on the eyes, nose or throat, and never injected, because of the serious effect it may have on the general health if used in this way for larger operations; also because of the fact that it goes bad very easily. Several new preparations have therefore been introduced which are used in the same way as cocaine, but have not its disadvantages. It is sufficient merely to give the names of some of them, as for example, novocain, novutox, stovain, eucain, borocain, pantocain, and percain. Quinine-and-urea-hydrochloride is found useful in some condition when a prolonged anæsthesia is desired, as its effects may last several days.

To obtain the effect of deadening the part to be operated on, these drugs are injected into the flesh of the part, or into or near the nerves which supply the part with the power of feeling, or they may be rubbed on, painted or sprayed on to the surface.

Another way of deadening pain in a small area is to freeze the skin of the part with a freezing mixture which is sprayed on to it. This deadens sensation for only a very short time and is very useful for opening small abscesses and similar short operations. Ethyl chloride is the drug generally used for this freezing.

Spinal Anæsthesia.—Sometimes the anæsthetic drug is injected straight into the spinal canal in the backbone, thus temporarily destroying all power of feeling below this point; the patient has usually been given a narcotic or stupefying drug such as morphia or scopolamine some time beforehand to help to obtain the deadening effect. These spinal anæsthetics are used for large operations on the lower body which take a long time and would otherwise require a long general anæsthetic and cause the patient a lot of shock.

Dental Anæsthesia.—For general work on the teeth the stand-by is nitrous oxide gas, commonly referred to as gas, or laughing gas. In the early days of anæsthetics nitrous oxide sometimes had the effect of making the patient laugh hysterically as the anæsthetic wore off, so it gained the popular name of laughing gas. This rarely happens nowadays, and very little discomfort is felt afterwards. The gas is breathed in through a covering called a "mask" which is placed over the patient's face. As soon as he is unconscious, the mask is removed and the dentist quickly extracts the teeth. The patient returns to consciousness within a minute. The gas given to children is usually ethyl chloride, which has a very disagreeable smell which has to be disguised by adding some sweet-smelling scent such as eau-de-Cologne.

When the gums are healthy and the patient is not of the "nervy" type a local anæsthetic is sometimes used. The drug, usually novocain, is injected into the root of each tooth.

Operations on the chest and on goitres on the neck require special care in the choice of anæsthetic, because the breathing apparatus is involved.

Anæsthesia and Analgesia in Childbirth.—Birth is always looked upon as a natural function, but the pain which now accompanies it is probably one of the penalties of civilization, and the mixture of races. The biblical teaching that pain and travail are associated with childbirth may to some extent account for the fact that so little attention has been paid to this in the past. When Sir James Simpson, of Edinburgh, endeavoured to bring relief to women in labour, his strongest opponents were those who brought out their ecclesiastical arguments.

Suffering, such as is often felt during childbirth, will cause exhaustion which is the chief cause of delay in the birth and the most frequent cause for forceps having to be used. The results of exhaustion may be shock, faintness, bleeding, and perhaps even blood-poisoning. In some cases the suffering brings about mental derangement, and this in rare cases has become permanent. The main difficulties to be met are that the pains of labour are prolonged for several hours, and that there are two lives to be considered, while the effects of drugs upon the unborn child are practically unknown.

Twilight Sleep.—As soon as the mother begins to feel that labour pains are beginning, small doses of scopolamine should be given. In order to carry out the proper procedure for twilight sleep, the patient should be put to bed in a darkened and sound-proof room. If the room cannot be made completely dark, a bandage should be placed over the patient's eyes. The ears should be plugged so that no noises from the outside are allowed to disturb her and the nurses must walk in rubber-soled shoes. Small doses of scopolamine should be given as long as the patient is still able to recognize familiar objects handed to her, and repeated until a state of amnesia, or loss of memory is reached. The object of this treatment is that the patient shall have no recollection of anything that takes place while she is in labour or while the child is being born. Should she wake up on account of some noise, it is very difficult to get her back to her amnesic state.

Gas, in the form of nitrous oxide and oxygen, is sometimes given to relieve labour pains, and it does not seem to have any ill effects on either the mother or the child, but the chief disadvantage of this is the necessity for the services of an experienced person to use the machine.

Chloroform.—Chloroform is a very satisfactory anæsthetic and can be used as soon as the patient feels the labour pains beginning. Small doses of chloroform are now being put up into ampoules so that anyone can use it without fear of taking an overdose.

Ether is used a great deal and is safer than chloroform; it seems to have less effect on the child and does not in any way interfere with the normal processes of childbirth.

Many of the after effects of an anæsthetic can be avoided if it is given properly, but nausea and vomiting frequently occur.

Treatment of Vomiting after an Anæsthetic.—The patient should be turned over to the right side. Strong black coffee or chloretone, may be given by mouth. Counter-irritation, such as a mustard leaf over the pit of the stomach, may help.

The "pernicious" type of vomiting, characteristic of delayed chloroform poisoning, is very serious; but the condition is treated by means of injections of glucose and insulin.

ANÆSTHESIA OF THE SKIN.—By anæsthesia is meant loss of the power of feeling, that is loss of sensation, in any part. The skin is sometimes affected in this way and the condition is rather interesting.

When loss of sensation in the skin occurs, it will often be found that for some time beforehand the skin has been unusually sensitive or tender (hyperæsthetic). The anæsthesia of the skin is always due to some damage to the nerves which supply the skin at that point, since it is through the nerves that we feel at all. This damage may be permanent, and feeling may never be recovered as in many nervous diseases. In leprosy the first thing that the unfortunate victim may notice is that in places he cannot feel even fire, if it is placed on his skin. A temporary loss of sensation in the skin may be due to some slight accident which has jarred the nerve but not destroyed it, or may be due to something rubbed on to the skin to deaden it, or a "freezing" mixture.

By carefully considering the areas of the skin that are insensitive, it is possible to discover which nerves are at fault and when the nerves corresponding to those areas are found to be in a healthy condition it is probable that the anæsthesia is due to hysteria, in which disease there are often areas on the skin which are so insensitive that a pin may even be stuck into them. These hysterical areas appear to have no relation to the areas which are supplied by particular nerves. For instance, it is not uncommon to find what is called the "glove and stocking" form of anæsthesia, in which the area which is insensitive is exactly that covered by the gloves and stockings and stops exactly where they end in a sharp line. In hysteria there are also patches of insensitiveness which may be found anywhere on the body. These patches have often been described in the old accounts of the trials of "so-called" witches, and unfortunately for the poor women who were accused of being witches it was thought that the patches were the mark of the Devil.

Treatment must be that of the disease which causes the condition.

ANALYSIS.—By analysis is meant the separation of anything that is made up of several different things into those different substances, which compose it. Clinical analysis of a disease means a thorough examination of the symptoms and course a disease is running in order to discover the

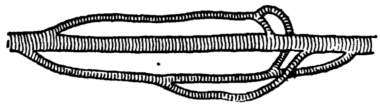
nature and cause of the disease. Chemical analysis is the splitting up of a mixture into the different drugs that compose it. A chemical analysis of milk will discover the proportion of fat, water, etc., present in the given sample. In the new treatment, called psycho-analysis, which is sometimes used for certain mental conditions, the contents of the mind as represented by thoughts, dreams, etc., are analysed, and this process is called the "analysis" of the patient.

ANAPHRODISIAC.—This is the opposite of aphrodisiac and is, therefore, a drug which diminishes the sexual desires. Bromides are anaphrodisiacs if taken for a long time.

ANAPHYLAXIS.—Anaphylaxis is a state in which an individual is so sensitive to certain substances that they constitute a poison for him, whereas they are harmless for other persons. "One man's food is another man's poison," applies to people who suffer from anaphylaxis or are anaphylactic, as it is called. Everyone knows someone who cannot touch fish, must not eat eggs, gets a rash when he eats strawberries, etc. Sometimes these people are born anaphylactic to the particular thing which disagrees with them, but sometimes the condition comes on after the nervous system has been subjected to some severe shock or strain. In women, anaphylaxis may develop after the birth of a child, for instance. It is often found that the things to which a person becomes anaphylactic are things for which he or she has had a great liking. In one case, a woman who had been accustomed all her life to eat one or more apples every day, became so acutely sensitive to apple poisoning after the birth of a child that she could not even walk through an orchard without being overcome with faintness. A common beginning of anaphylaxis is when a serum or vaccine is being taken in continually increasing doses and suddenly one dose makes the patient violently ill for a short period, and any further dose would cause a similar or worse attack, the patient has become anaphylactic to the serum. Anaphylaxis is part of the condition known as allergy, and the article on allergy should be read by anyone interested in the subject. Asthma, urticaria and hay fever are all allergic diseases and, as is well known, while they do not rank as dangerous diseases they cause a vast amount of discomfort and suffering in civilized countries. They are not diseases of native races. A great deal of research work is being done to try to discover ways of preventing or dealing with these allergic conditions, and it is to be expected that there will be interesting developments in the treatment of them as progress is made in the researches. (*See also* ALLERGY.)

ANASARCA.—Anasarca is another name for dropsy, or the accumulation of fluid in the tissues of the body. To tell whether the condition is present press firmly with the finger on the skin. If the depression made by the finger takes some time to fill up dropsy is present.

ANASTOMOSIS.—The junction between two blood-vessels is called the anastomosis of the vessels when the circulation is established by communicating branches when the main channel is blocked.



Anastomosis

Sometimes it is necessary to establish a new channel of communication between two organs or two distinct parts of the same organ. This also is an anastomosis. An example of this is when one part of the bowel is removed because of disease and the two sound parts on either side of it are opened into each other.

ANATOMY.—By the term anatomy is meant the study of the various structures which make up the human body. The knowledge of anatomy which we have to-day has been gained during hundreds of years of painstaking dissection of the human body, and the amount of knowledge that has been thus acquired is indeed vast.

In the science of anatomy the various systems of the body are grouped under the following headings. Osteology, the skeleton or bony parts of the body; Syndesmology, the articulations or joints; Myology, the muscles; Angiology, the vascular system including the heart, blood-vessels, lymphatic vessels and lymph glands; Neurology, the study of the nervous system; and Splanchnology, the description of the viscera or organs of the body, including the parts of the brain, the breathing apparatus, the digestive system and the genito-urinary organs.



L. Ginsberg

A STUDENT STUDYING ANATOMY

Anatomy forms part of the curriculum of every doctor, nurse and masseuse.

ANDROPHOBIA.—Fear or dislike of the male sex.

ANEURYSM.—An aneurysm is a swelling caused by an abnormal swelling of an artery. An external aneurysm or aneurysm of a limb may be the result of an accident, and if it can be reached it may be treated surgically. The most serious form of aneurysm is that of the aorta, or large artery, into which the blood from the heart is pumped. The most common cause of aneurysm is syphilis ; but chronic alcoholism, rheumatism, Bright's disease and other diseases may cause it. It usually occurs in persons over the age of thirty, and men are more frequently attacked than women. Occupations involving strain predispose towards it.

The symptoms of aneurysm are very variable, but there will be pain, faintness, swelling of the face, neck, arms or hands, breathlessness on exertion and often coughing and bringing up of blood. The throbbing of the artery may be visible on inspection of the chest. The veins of the chest may stand out or the aneurysm itself may be seen as a throbbing lump. In some cases there is a distinctive thickening or clubbing, as it is called, of the fingers of the left hand. The left arm may also be considerably swollen. Sometimes the aneurysm does not cause much discomfort and ill-health, and the first notification of its presence may be the coughing up of blood.

Treatment.—The treatment of aneurysm is always a matter for a doctor. Some aneurysms become cut off by hardened clotting and cause no more trouble; others run a long course up to twenty years and enable the patient to carry on with merely modified activity. The treatment should begin with some months in bed with treatment of the various symptoms, and when the patient is allowed up again, he must be careful to avoid all violent exertion.

ANGINA.—Angina is a term meaning literally choking, and is used for conditions where there is a sense of choking or of suffocation, especially diseases of the throat or chest which have such symptoms. Fibrinous angina or Vincent's angina is a non-infectious disease of the throat closely resembling diphtheria, in that the throat becomes ulcerated and has a foul-smelling membrane, but it is not dangerous to life like diphtheria. Angina pectoris or cardiac angina is a heart disease in which a characteristic symptom is the sudden feeling of suffocation. (*See also* ANGINA PECTORIS.)

ANGINA MINOR, or PSEUDO-ANGINA.—A condition with symptoms that are very liable to be mistaken for angina pectoris is the cause of great mental anguish to many men, especially youngish men, who think they have got the true angina. This "false angina" is a nervous complaint brought on by over-smoking, too much tea-drinking, or coffee-drinking. There is pain in the region of the heart, palpitation, and sometimes pain down the left arm. Emotion brings on the attacks, and they are as common in women as in men. The condition is mild and unimportant, and can easily be overcome by cutting down smoking and tea-drinking, and toning up the nervous system. Unfortunately many people do not believe their doctors and continue to suffer the mental anguish of thinking that they have angina pectoris.

ANGINA PECTORIS.—Angina pectoris (breast pang) is a disease affecting the heart and sometimes leading to sudden death. It is greatly dreaded by all sorts of people who are past their first youth, but this need not be so, because it picks its victims almost entirely from certain classes of people. Women rarely suffer, although, now that women are engaged more in work outside their homes, it is becoming more frequent amongst them, and manual labourers are not often attacked. It is most common in those whose life is one of stress and strain. Worry seems to be an active factor in causing it, and it has been called the doctor's disease because it is very common in the medical profession. The typical sufferers from angina pectoris are business men or shopkeepers, leading lives of strain, eating, drinking and smoking to excess. It is to some extent hereditary, and has been found in members of the same family for several generations.

Symptoms.—The symptoms depend upon the severity of the attack. In the mildest form there may be only a feeling of tension or discomfort, which may grow to positive pain, deep in the region of the breast bone. This discomfort often follows emotion and sometimes exertion. It may be present on rising to speak in public, but this soon passes off. Muscular effort, such as climbing a

hill or going upstairs, may bring on the sensation. In a "high pressure" life a man may feel this tension in the breast for weeks without any pain, or without being able to pin it down to any one spot. It disappears after a night's rest and may disappear entirely when the "harness" is taken off.

Severe Angina.—In severe angina there is definite disease of the heart or blood-vessels leading to the heart, as well as the nervous condition which causes the anginal attacks, and it is in this form that there is a liability to sudden death. Mental emotion or muscular effort are the usual causes which bring on attacks. John Hunter, the famous surgeon who was afflicted with this disease, used to say that "his life was in the hands of any rascal who chose to worry him," and a fatal attack actually occurred in a fit of anger. The scene was at a meeting at St. George's Hospital, London. The meeting was not going as Hunter liked and he became excited, had an attack of the terrible pain that accompanies angina pectoris and was carried into a side room, where he died.

An attack of Angina Pectoris.—As stated previously an attack is usually brought on by emotion or exertion, an angry scene at a meeting, or a "late for the train" rush to the station and the person is seized with a violent pain in the region of the heart and a feeling of tightness as if the heart had been seized in a vice. He either falls to the ground or remains doubled up and motionless on a bench or against some such support as a wall. Pains shoot down his left arm and there may be numbness of the fingers and round about the heart. His face grows pale and ashy and often a profuse sweat breaks out. It has been described by a sufferer as though the "icy hand of death had clutched the heart." The attack may occur when he is crossing the road and even though there may be cars bearing down upon him he will be powerless to move. The attack lasts from a few seconds to a minute or two, and during the attack the sufferer feels that he is going to die. This feeling of approaching death is typical of angina pectoris.

The attack, though so severe, is mercifully short. It is all over in a few seconds or minutes. The patient may pass into a faint, he may drop dead at the height of the attack, or he may be suddenly relieved of his pain, straighten himself up and proceed on his way. He will feel exhausted and shaken for some time.

Treatment.—When a man has had an attack of true angina he must realize that the time has come to "go slow." If he can retire from business he should do so, keeping a small interest in it if he would be happier that way, but not an interest which would involve him in any responsibility or put him in a position where he would have to make decisions. After an attack prolonged rest is absolutely necessary, and it must be rest in which all sources of irritation and anxiety are removed from him. The diet must be simple and the bowels must be kept open freely.

There is a wonderful drug called nitrite of amyl which gives instant relief when inhaled. Sufferers from angina pectoris carry this around with them in their pockets and use it when they feel an attack coming on. It is put up in little capsules for this purpose. These are crushed in the fingers in a handkerchief and held to the nose. When a doctor can be on the scene quickly enough he may give morphia.

Angina pectoris is a warning by Nature that life must be slackened down, because the machinery is wearing thin. The question of diet has become one of great importance to the sufferer. He must, if he is to continue living, give up heavy meals, smoking and alcohol in any quantity. He will not want to take violent exercise, but he should live on the level as much as possible, and avoid going up and down stairs as much as he can. If he takes care of himself he will probably live comfortably for years. If a man younger than forty years is attacked with the true variety of angina pectoris, he must be examined for signs of syphilis and have this treated if it is present.

ANGIOLOGY.—The science of the blood-vessels and lypmhatic vessels and lymph glands. (*See also* ANATOMY, ARTERIES.)

ANGIOMA.—This is the medical term for a tumour or swelling which consists of a mass of any kind of blood-vessel. The form of angioma which is most common is a birth-mark or nævus.

ANGIONEUROTIC ŒDEMA, or GIANT URTICARIA.—In spite of its somewhat long name this is a fairly common complaint which ranges in severity from a mere discomfort to a serious upset of the general health. The chief feature of the condition is the sudden

appearance of swellings in the skin, or the tissues under the skin. These swellings come up suddenly and are hot, red and intensely irritable for a short time; then they subside and disappear just as quickly as they came. In a severer form there may be swelling internally in the membranes which line the different organs of the body, and for the time being a serious condition may be caused by pressure of the swellings, and the blocking of swollen passages. When the lining of the heart—called the pericardium—swells, there may be severe heart symptoms. The most fatal swelling is that of the throat. When this occurs the larynx may swell so rapidly and to such an extent, that the patient is suffocated unless an immediate operation is performed and a tube put into the windpipe, for the patient to breathe through. The lips may swell to such an extent that the mouth cannot be opened or the hands and feet may be so swollen that the fingers and toes cannot be bent.

The causes of angioneurotic œdema are not definitely known. In many cases it is hereditary and runs in families where other diseases of the class called "allergic diseases," such as hay fever and asthma, are found. In these cases the complaint usually causes no trouble beyond the liability to swell about the face and limbs and parts where there is pressure by the clothes, etc. In other cases the condition first appears after some severe shock to the system such as childbirth; poisons in the system, nervous exhaustion, shock and cold may be to blame. It often occurs together with urticaria, the condition which is popularly known as "hives" or "nettlerash."

Treatment.—Immediate treatment is important and, if a doctor is at hand, he will immediately inject adrenaline, or peptone and ephedrine into the muscular tissue of the body. This injection usually has a remarkable effect in stopping the attack from becoming a bad one. The general treatment follows the same lines as the treatment of other "allergic" states. The general health must be looked to, foci of infection must be sought out and attended to. In chronic cases long courses of injections of peptone may be of material benefit. Glucose, calcium and ephedrine taken by mouth are all useful in certain cases. A long holiday may help to clear up the condition, which in the non-hereditary varieties will usually wear itself out in from one to three years' time. (*See also* ALLERGY.)

ANGOSTURA (Cusparia Bark) is a bitter and stimulating tonic. (*See also* BITTERS.)

ANILINE.—A colourless liquid with a faint, peculiar odour. It is only slightly soluble in water, but dissolves readily in alcohol and ether. Combined with chlorine, the chlorates and hypochlorites, it yields the various aniline dyes known as aniline blue, aniline green, etc. From aniline are obtained the important substances known as acetanilide and exalgin, which are remedies which relieve pain and lower the temperature in fevers. Acriflavine and others of the aniline dyes are used as antiseptics.

Poisoning by Aniline.—In cases of poisoning, an emetic should be given as soon as possible. One or two tablespoonsful of mustard in half a glass of water is a very useful emetic, or common salt in just enough water to melt it, is another handy remedy. The patient should be kept warm with hot-water bottles until the doctor is able to attend

ANIMAL HEAT.—The temperature—the heat of the body—is one of several guides to a person's condition, and it is taken with a thermometer.

Clearly marked on the thermometer are figures giving the temperature of a person in ordinary health, for it has been found that we all, in health, register pretty much the same. This normal temperature is known as *animal heat.*

When a boy comes in from a game of football with the perspiration streaming from him, he is giving off some of his body-heat in a perfectly natural way through the pores of the skin. We are meant to relieve unusual heat by perspiring.

The story used to be told of a proud mother who covered her little boy with gold leaf and sent him to a fancy-dress party as Cupid. Whether any mother ever was so foolish is not known, but the moral of the story was that he looked so angelic that she could not bear to take the gold leaf off, so she put him to bed just as he was, and in the morning he was dead! His mother had stopped up the pores of his skin, so that they could not act. All over the skin are millions of minute sweat-glands; on the inner part of our hands we have nearly three thousand of them to

one square inch. Some of the natural heat of the body escapes that way.

But we are using up our natural heat all the while, even if we are not working or playing, because that marvellous little engine the heart never stops so long as we are alive, and our lungs are at work too, as well as other organs of the body; so that just as an engine driven by petrol or coal or oil uses up its heat as it works, so we use up ours. And just as you must stoke the engine if you want it to go on working, so we must stoke our bodies, else we starve and they go on strike.

Fat for Heat.—We must eat to live, and to keep up our natural body-heat we need certain foods. One of these is fat. Every explorer knows this; people who live in intensely cold climates make a habit of eating fat, and we should remember, in the cold weather, to arrange for fat in some form in the daily menu. The trouble is that many people, especially children, dislike fat; the very word brings to their minds an unappetizing slab of cold white stuff only fit for the dust-bin. But there is bacon, which contains a large proportion of fat; herrings; and there is butter, which most people digest easily.

Clothes do not *give* warmth to the body, though they help to *keep it in*. So airmen, and many other people who can afford it, wear leather coats; and children are sent to school in neat and cosy little leather-cloth coats which not only look smart but, as we say, "keep them warm," and most of us wear more or thicker clothing in winter.

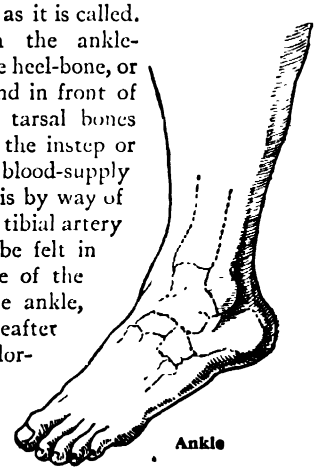
ANIMALS AS DISEASE CARRIERS.—Quite a few diseases, especially skin diseases, are caught by human beings from domestic animals. Favus, a skin disease very much like ringworm, is sometimes conveyed to children by cats. Glanders is an infectious disease which chiefly affects the glands, eyes and noses of horses, but persons who handle them are liable to contract the disease.

No less important is it to remember that the family cat is very well qualified to act as a "carrier" of infectious diseases. In its various prowlings and hobnobbings with other cats, it is very liable to pick up all sorts of microbes. Diphtheria and some other infectious diseases have been known to owe their onset to the handling of these pets. Tuberculosis is greatly spread through the medium of infected meat and milk, and scarlet fever and diphtheria may also be had from certain diseases of the cow. Mice and rats are notorious disease spreaders, and it is a well-known fact that mice are particularly prone to cancer although the cause of this disease has not yet been settled. Rats are instrumental in carrying bubonic plague as well as many other diseases.

ANISOCORIA.—This is a condition in which the pupils of the eyes differ in size. (*See also* Eye.)

ANKLE.—The ankle is the joint where the bones of the leg meet the bones of the foot. It is a joint of the hinge variety, and allows two movements: the raising of the foot and the lowering of the foot. The movement of raising the foot is called dorsiflexion, and the movement of lowering the foot plantar-flexion. When a person is standing erect the foot should be at right angles to the leg.

The ankle-joint is formed by the lower ends of the bones of the leg, which are called the tibia and fibula, and the ankle bone, or astralagus, as it is called. Underneath the ankle-bone lies the heel-bone, or os calcis, and in front of it the five tarsal bones which form the instep or tarsus. The blood-supply of the foot is by way of the anterior tibial artery which can be felt in the mid-line of the front of the ankle, and is thereafter called the dorsal artery of the foot (dorsalis pedis), and the posterior tibial artery (plantar arteries) which can be felt below the ankle on the back of the heel.



Ankle

The ankle is surrounded by ligaments which connect the surface of the lower end of the tibia to the ankle bone. Other ligaments bind the ankle bone to the heel and bones of the foot.

The ankle joint is a very powerful joint, and is not often dislocated, but it is the most frequently sprained joint in the body, and is very often the site of synovitis or watery swelling, and disease or injury may lead to ankylosis or severe stiffening of the ankle joint. (*See also* Ankle, Injuries to.)

ANKLE, INJURIES TO.—The ankle joint, which has to support the entire weight of the body, is necessarily a very strong joint and is strongly supported by ligaments. It is not therefore easy to dislocate it, though dislocation sometimes does occur, most often in cases where there is a smashed bone as well. The treatment is a matter for a skilled surgeon, as the joint very easily becomes stiffened and rigid and a permanent limp and weakness may sometimes result. A less severe form of dislocation and fracture at the ankle is that known as Pott's fracture, where the fibula is fractured at its lower end, the ligaments of the ankle joint are torn, and the foot is bent in an outward and backward direction. This may happen by some such accident as slipping off the sidewalk, or landing after a jump with the feet turned out. It may not incapacitate the individual at the time, but may be regarded as only a severe sprain until X-ray examination shows the true situation. In another fracture of the ankle called Dupuytren's fracture, the two leg bones, the tibia and fibula, may be separated and the ankle bone may be pushed up between them. In this latter case it may be difficult to make the two leg bones keep together, and it may be necessary for a surgeon to drive a nail through them to keep them together.

Sprained Ankle.—Although fractures and dislocations of the ankle are comparatively rare, there is no joint which is so easily and so frequently sprained. A sudden turning of the foot may be enough to cause a sprain, which is a tear of a whole or part of the ligament at the side of the ankle. The symptoms are intense pain, marked swelling and discoloration, but the joint can still be freely moved. A firm bandage should be applied and kept on for forty-eight hours, after which massage may be started and the joint kept strapped in the intervals. In a slight case the patient may begin to put weight on the foot after a few days, provided that the ankle is well strapped and a strong boot is worn. Slippers should not be worn again for a considerable time.

ANKYLOSIS.—This is the name given to the stiffness of the joints which is sometimes found after an accident or some diseased condition when the bones forming the joint have grown together. Sometimes the stiffness may be due to adhesions or tough bands which have formed, or to the shortening of ligaments and muscles, in which case the joint will still be able to move, though its movements are limited.

ANKYLOSTOMIASIS.—The medical name for Hookworm Disease or miner's anæmia. The condition is described under HOOKWORM DISEASE.

ANODYNE.—An anodyne is a medicine that gives relief from pain.

ANONA.—A tree which is cultivated in all tropical countries. The fruit is a favourite food and is greatly used for making cooling drinks to use in cases of fever. The bark and roots are also used for medicinal purposes, and the leaf is used for killing the various sorts of worms which breed in the human body, especially in very hot countries. (*See also* WORMS.)

ANOPHELES.—Anopheles are the species of mosquitoes which carry malaria, the disease which is such a scourge in tropical countries. Like other sorts of mosquitoes they only breed where there is marshy ground or stagnant water, and even a bucket of water kept handy in case of fire may become a breeding-spot unless it is kept carefully covered over. Mosquitoes very rarely fly far from their breeding-places, and the anophele is no exception to this rule; they may, however, be blown by the wind over a considerable range. The female insect may lay anything from 50 to 400 eggs, and she requires blood to feed them on. (*See also* MOSQUITO.)

ANOSMIA.—This is the name given to the condition in which the sense of smell is lost. This happens sometimes for a few days, or weeks, after influenza or other such illnesses. Very rarely the sense is permanently lost.

ANOXÆMIA.—Lack of oxygen in the blood. Oxygen is one of the gases of which air is made up, and it is necessary to keep the body in health. The body obtains oxygen by breathing air into the lungs and separating the oxygen from the other parts of the air which are then breathed out again, while the oxygen is taken up into the blood-stream and distributed throughout the body in a manner which is described in the article on the circulation of the blood. Lack of oxygen in the blood occurs in diseases where the breathing is out of order, such as pneumonia, or when a person is high up in mountains or in an aeroplane or balloon. The condition

is then called mountain sickness or balloon sickness. (*See also* MOUNTAIN SICKNESS.)

ANT BITE.—Ant bites are not a matter of great importance in the British Isles, but they are sometimes seen, perhaps when a person has been foolish enough to sleep on the ground in the neighbourhood of an ant hill. There may then be troublesome little red and itchy bites which should be treated by bathing with some alkaline solution such as bicarbonate of soda, and otherwise treated as like midge or mosquito bites. (*See also* BITES AND STINGS.)

ANTACID.—An antacid is any substance which counteracts or neutralizes acidity. Any alkali substance is an antacid. (*See also* ACIDOSIS; ALKALOSIS.)

ANTEFEBRILE.—The period before a patient becomes feverish.

ANTE-NATAL CARE.—For the normal and healthy woman the months before her baby is born should be a time of physical well-being and happy preparation; but in too many cases this is not so, and the expectant mother is harassed with discomforts and ailments which very often are simply due to ignorance and could be avoided or relieved. In some cases she drifts into more serious conditions, which may even cause her to lose her own or her baby's life at the time of birth or in the first few months after. Thirty years ago, at the beginning of the present century, more than 150 babies out of every 1,000 were doomed to be born dead or die shortly afterwards, and 4 or 5 mothers out of every 1,000 died in childbirth. To-day the situation with regard to infant life has improved by half, but the death-rate amongst mothers remains almost as great and more than 3,000 women in England and Wales die each year giving birth to children. Being a mother is still the most dangerous profession in the world, even more dangerous than coal mining.

The decline in the infant mortality rate can be directly traced to improved conditions of living and the facilities that are now provided for the care and instruction of expectant mothers.

The chief difficulty which has to be overcome is that of getting the expectant mothers to come to the ante-natal clinics at the hospitals or child-welfare centres, or to consult with their own doctors or attend motherhood classes. This is often due to shyness, but in many cases it is due to the ignorance of the young woman as to what lies before her, and how she should do her duty to herself and her unborn child. Often the young woman is not encouraged to go to the ante-natal clinic by the older women who advise her. They say that Nature will do all that is required in the way of looking after the pregnant woman. Childbirth is a natural process, and the normal woman who lives a normal life does come through the experience with little strain; but some women are not normal, and if the condition from which they suffer is discovered in time a great deal of future suffering may be spared.

Every woman should have herself examined as soon as she knows that she is going to have a baby. Any abnormality or deformity will then be discovered, and she will be told how to conduct her life and look after her health in the way best suited to her condition; and it must not be forgotten that for the nine months before birth the mother's health is the baby's health. (*See also* CHILDBIRTH; CHILD WELFARE SUPPLEMENT; PREGNANCY.)

ANTERIOR.—This term is used medically to describe any organ or part of the body that is in front of any other part. The opposite of this term is posterior.

ANTERIOR POLIOMYELITIS.—*See* INFANTILE PARALYSIS.

ANTHELMINTIC.—Any drug which is used to kill intestinal worms is called an anthelmintic. In many cases the parasites are not killed in the intestines, but are so violently stimulated or stupefied by the drug that they are swept away by the usual castor-oil purge, which is administered after an anthelmintic is given. Some examples of anthelmintics are Thymol and Male Fern.

ANTHRACOSIS. — Anthracosis (or Silicosis), commonly called *black lung*, or coal-miner's lung, is a disease of the lungs arising from the continuous breathing of air containing particles of coal dust. The disease is growing less prevalent, and with still better ventilation of our coal mines, the adoption of wet drilling or direct exhausts to the drills, and, if the circumstances require it, the use of respirators, the disease would become a rarity. The lung becomes black in appearance and tough in texture. The chief symptoms are breathlessness, and cough with black expectoration. The patient must

be removed from mine dust permanently, and should take particular care to avoid chills or anything which would lead to catarrhal colds and bronchitis. Diet should be light and any exertion which causes breathlessness should be avoided.

ANTHRAX.—An acute infectious disease due to a germ called the Bacillus anthracis. It is common amongst animals, such as sheep, cattle and horses, which become infected with it after eating infected grass. Human beings become infected on the skin by handling the infected hides of animals, or by using infected shaving-brushes which are usually made from horse-hair. The lung variety of anthrax results from inhaling bacilli in the handling of wool (wool-sorter's disease), and possibly the intestinal form is due to eating infected meat.

Infection occurs usually through a bruise or cut in the skin, and the incubation period is sometimes less than 24 hours. The first thing that may be noticed may be itching on the skin of the face, arm or neck, and a small red pimple may appear at the site of the itching, which quickly becomes inflamed and angry-looking. This may at first be mistaken for an ordinary boil or septic spot, but the appearances quickly become very characteristic in anthrax. The pimple becomes encircled by small whitish blisters, and in a day or two, black slough or dead matter may appear in the centre. The neighbouring glands are usually enlarged and the temperature may be anything from normal to about 103° F. If the case is treated efficiently within a day or so of its onset the hope of recovery is very good, but in severe cases death may occur within a week. The sore should not be opened, as this increases the risk of blood-poisoning.

Treatment consists in cutting out or cauterizing the pustule and giving injections of special serum. (*See also* ANTIBODIES; SERUM.)

ANTHROPOLOGY.—Anthropology is the science of the nature of man and mankind, both from bodily and mental points of view.

ANTIBODIES.—Diseases are most often caused by the invasion of the body by swarms of germs or bacteria, which rapidly increase in number and swarm in the blood. The body, however, has the power to produce other substances in the blood and tissues which destroy these bacteria and neutralize the poisons which they manufacture in the blood. These other substances are called antibodies and antitoxins. When a sufficient number of antibodies have been produced in the blood to deal with the bacteria and get the upper hand of them the person will recover from the disease, or will become immune to it. This is the principle at the root of vaccination and inoculation against disease. By injecting the bacteria or their poisons into the blood of a person when he is well and healthy his blood will be enabled to produce a supply of antibodies which will protect him from the germs of the disease when he becomes infected with it, and he will either not have it at all, or will have it in a much milder degree than he would if his blood did not already contain antibodies.

ANTIDIPHTHERITIC SERUM. — This is a serum, or a preparation from a serum, which contains the substances which the blood produces to neutralize the poisons formed by the germs of diphtheria. It should always be injected at once as soon as any signs of diphtheria appear, otherwise the patient will have a very poor chance of recovery. It is usually given also to people who have been in contact with the case to try to prevent their taking the disease. So necessary is this serum that supplies of the fresh serum are kept ready for immediate use by all medical officers of health.

ANTIDOTE.—An antidote is any substance which prevents or counteracts the action of a poison. As the quick administration of an antidote may save the life of a person who has taken poison either accidentally or on purpose, it is the duty of every grown-up person to know at least some of the common antidotes, and a list of them should be kept handy in every household and works, etc. Coffee, made very strong, acts as an antidote in opium poisoning and cases where the patient tends to become drowsy. Strong tea acts in the same way in morphia poisoning. Acids are antidotes to alkalies and, similarly, alkalies are antidotes to acids. For quick reference a list of poisons and their antidotes is given under the heading POISONS in the FIRST AID SUPPLEMENT.

ANTIFEBRILE.—Anything used for bringing down the temperature and reducing fever is called an antifebrile or febrifuge.

ANTIFEBRIN.—The proprietary name for acetanilide. (*See also* ACETANILIDE.)

ANTIMONY.—Antimony is a metal possessing a bluish-white shiny appearance. In commerce it is chiefly used for mixing with other substances. In medicine it used to be used a great deal in the treatment of bronchitis. Nowadays it is chiefly used in the treatment of syphilis and malaria, and in certain diseases caused by parasites such as bilharziasis.

Poisoning by Antimony.—In cases of poisoning by antimony the patient should be made to vomit by giving an emetic of a tablespoonful of mustard, or salt, in half a tumblerful of warm water. Strong tea should then be given, and the patient should be fed on milk and white of egg. He should be kept warm by putting hot-water bottles at his feet and sides.

ANTIPARASITIC.—Any drug which is used to kill parasites is called an antiparasitic. All antiseptic drugs are antiparasitics as well as antiseptics. Antiparasitics are also termed parasiticides.

ANTIPHLOGISTINE.—An agent or substance which reduces or subdues inflammation or fever is called antiphlogistic. *Antiphlogistine* is the name of an antiseptic paste which is used a great deal instead of poultices.

ANTIPYRETIC.—A drug which is used for lowering the temperature. The most important antipyretics are phenacetin and phenazonum; but, as a rule, drugs are used very little in this respect because of the collapse they may produce. Cold, such as a cold bath, or sponging, or the application of ice packs, is the method which is used a great deal for lowering the temperature in cases of fever. Quinine and salicylic acid are necessary drugs in cases of malaria and rheumatic fever.

ANTISCORBUTIC.—Antiscorbutics are substances which are necessary to prevent or cure scurvy or scorbutus. Scurvy arises through lack of certain vitamins, chiefly the vitamin known as " water-soluble C." The best-known antiscorbutics are orange and lemon juice, fresh green vegetables, and fresh milk.

ANTISEPTICS.—An antiseptic is a substance which is used to prevent the growth of germs; a disinfectant is a drug which is used to kill them. It is important to know the difference between the two, because a drug which is disinfectant in certain circumstances will, in other circumstances, act only as an antiseptic. Certain antiseptics, such as carbolic acid, etc., lose much of their power through having to be well diluted with some other substance. Carbolic acid if used alone for any length of time would cause great damage to the tissues and thus defeat its own ends. This antiseptic is used a great deal as a deodorant and disinfectant for drains, bed-pans, soiled linen, and surgical instruments. A dilute carbolic lotion is used to wash wounds and keep them antiseptic. Carbolic gauze and carbolic lint preparations are also very useful for dressing wounds.

Formaldehyde is a powerful antiseptic disinfectant, but it is not much used in surgery because it tends to retard healing. The vapour from formaldehyde is recommended for disinfecting sick rooms after illness. It does not destroy coloured materials nor damage books or pictures.

Preparations of iodine are used a great deal in cases of chronic inflammation of the joints, and many other conditions. Iodide and glycerin is used as a throat paint in cases of tonsillitis. Iodine applied to the skin produces a bright yellow stain, but the decolorized tincture of iodine has the advantage of not staining the skin.

Hydrogen of peroxide is perhaps one of the most well-known antiseptics. It is most beneficial in its action on suppurating wounds; the effect of the gas bubbles helps to remove much of the pus. It is invaluable in aiding the removal of dressings which are sticking to a wound. The dressing should be well soaked in a warm solution of peroxide of hydrogen, and it will then come away more readily. This antiseptic makes an excellent mouth wash and deodorant, and also helps to keep the teeth clean and white. It is a very popular ingredient in hair-washes as it possesses quite strong bleaching properties.

Potassium permanganate can be used as a mouth wash or gargle, a solution of 1 in 500 if the mouth condition is foul. In cases of gonorrhœa and in uterine diseases a solution of 1 in 1,000 may be used as a douche. This drug is used a great deal as a deodorant for drains, etc., and it is particularly suitable as an antiseptic for the hands as it does not irritate the skin.

Boric acid or boracic acid makes an

excellent mild antiseptic and is largely used to keep wounds, ulcers and sores clean and sweet. Boracic lint is very frequently used to dress wounds. A saturated solution of boracic acid may be used as an antiseptic eye-wash; this is also useful in cases of fetid perspiration of the feet.

These are but a few of the many reliable antiseptics, and there are numerous patent ones to be had.

Antiseptic surgery was first introduced by Lord Lister when he was professor of surgery at Glasgow in the year 1868, and since then the method has developed into aseptic surgery, germs being *prevented* and not merely killed off when present. At a modern operation every instrument, dressing, and the operation table is aseptic, and the nurses and the surgeons and the surrounding atmosphere are all rendered as aseptic as possible. In this way the treatment of surgical wounds becomes a comparatively slight affair in comparison with former days when death from sepsis was the rule rather than the exception. (*See also* DISINFECTION.)

ANTISPASMODIC.—Antispasmodics are drugs which relieve colic or spasms, sudden convulsions, or contraction of muscles. These drugs include the narcotic drugs such as belladonna and opium, and carminative drugs such as sal volatile, etc. In severe colic, the spasmodic pains may be relieved by the application of a hot-water bag or a hot fomentation over the abdomen.

ANTITOXIN.—An antitoxin is a substance formed in the blood to protect the body against an invasion of germs. It neutralizes or combats the poisons produced by the germ, but the antitoxin for any particular disease will only neutralize the toxin or poison of that disease. For example, the antitoxin for diphtheria will have no effect against the toxin for lock-jaw, and vice versa.

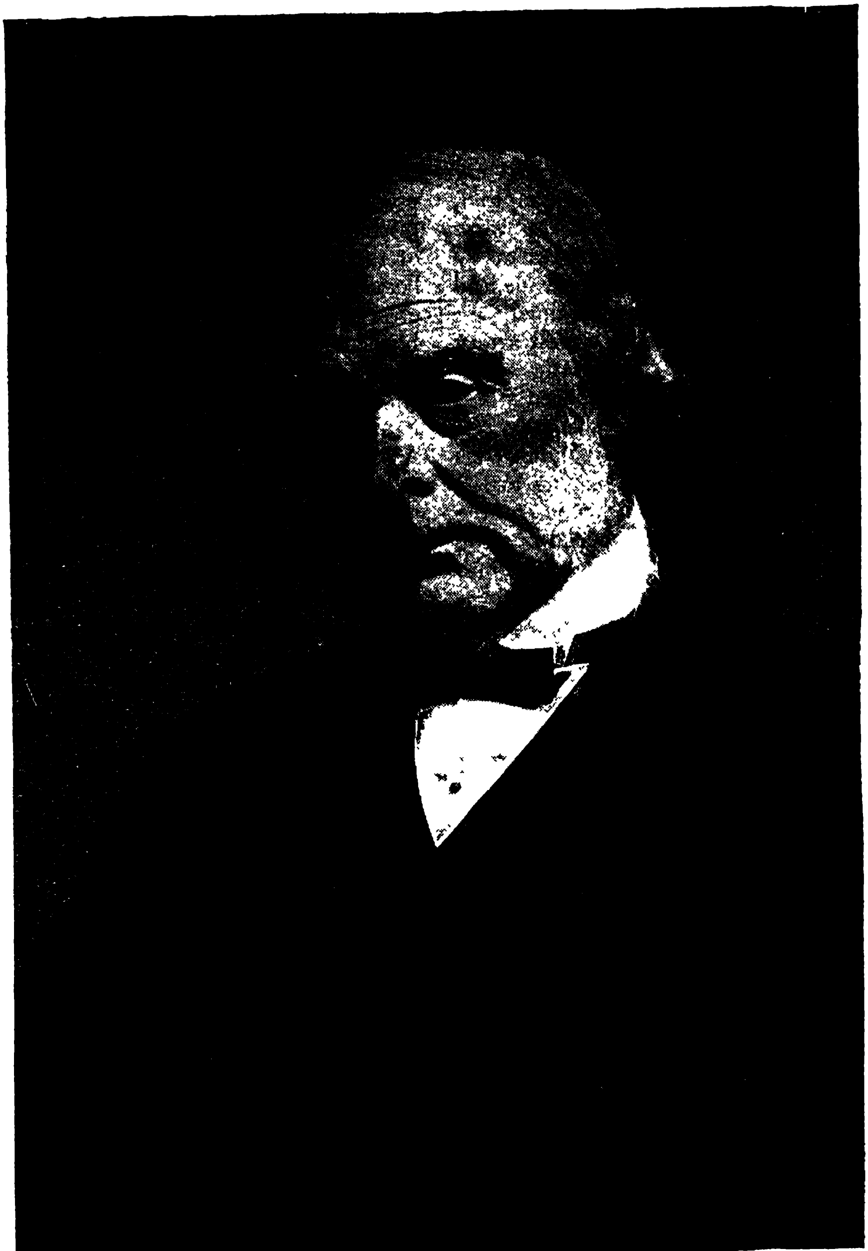
ANTIVACCINATION.—Opposition to the practice of compulsory vaccination.

ANTIVIVISECTION.—Opposition to "vivisection" or experiments on living animals.

ANTRUM.—The antrum is the largest of the sinuses or spaces filled with air in connection with the nose, and lies within the upper jaw. The opening into the nose is situated high up in the antrum, and is thus badly placed for drainage. When, therefore, the antrum becomes infected, either from the nose through influenza or a similar cause, or from an abscess at the root of a tooth in the upper jaw, it is difficult for the infection to clear up naturally, and the antrum usually has to be drained surgically, either by having a small cannula passed into it, or by an operation under local or general anæsthetic. A one-sided nasal discharge makes a doctor suspicious that the antrum is infected, and sometimes there is an unpleasant smell in the nose; it may be necessary to have the nasal sinuses X-rayed for confirmation of the diagnosis. Chronic infection of the antrum may have a serious effect on the general health and may even give rise to suspicion of tuberculosis through the debility it causes. (*See also* SINUS.)

ANUS.—The opening at the lower end of the rectum, or lowest part of the large bowel, is known as the anus. In certain cases an opening may have to be made from the lower bowel to the outside at some point above the normal anus; this is termed an artificial anus. Imperforate anus is the term applied to complete absence of the natural opening which is found sometimes in newborn babies; in such cases a surgical operation is necessary. Fissure, fistula, piles, abscess, pruritus, prolapse and stricture, are conditions which occur in the region of the anus.

ANXIETY.—In its medical sense "anxiety" means that a person is afraid of something without reasonable cause. Often he recognizes that his fear is unreasonable but he is unable to overcome it. Usually the fear is of some definite state, object or action. Fear of the dark, of being in closed spaces, especially in trains or rooms with the door shut; of heights; of cats, mice or spiders; of crossing roads: these are all common examples of these unreasonable fears. They have their foundation in long-forgotten episodes in childhood, which have been pushed into the background of the mind, the *unconscious mind* as it is called. When a patient's health is affected by brooding on these fears, he is said to be in an *anxiety state*, and his health may suffer to such an extent that only after much careful inquiry will the real cause of his symptoms be found in his fears. Easy fatigue on slight exertion, generalized headache or a feeling of pressure on the tip of the head, loss of weight and difficulty in sleeping are the chief general symptoms. Vague



Elliott and Fry

JOSEPH, BARON LISTER, O.M. (1827-1912)
Discoverer of the antiseptic method which revolutionized surgery

pains all over the body are common, the appetite is generally poor, and indigestion, constipation or diarrhœa are often complained of. Palpitations of the heart and flushing of the face are often wrongly thought to be due to something the matter with the heart, and this adds another unreasonable fear to the patient's troubles. Difficulty in fixing the attention for any length of time is the chief mental symptom, and this in itself makes the patient worse through fear of losing his employment by bad work. Such a patient needs the medical help of his own doctor for a long time.

AORTA.—The aorta is the largest artery of the body. It is the chief of the vessels which carry blood, after it has been mixed with oxygen, to the tissues of the body. It begins at the left side of the heart and extends downwards and backwards, keeping to the left of the backbone until it enters the abdominal cavity through a special opening called the *aortic hiatus.* There it divides into two branches called the right and left *common iliac arteries.* In its course it is called by several different names. It begins as the *ascending aorta,* whose branches are the *right and left coronary arteries* which supply the heart. The second portion of the aorta is called the *arch of the aorta.* It curves upwards, backwards and to the left behind the breast-bone, and joins on to the descending aorta. The branches of the arch of the aorta are given off from the top of the arch and are called the *innominate,* the *left common carotid* and the *left subclavian.* The descending aorta divides into two portions, the *thoracic* and the *abdominal aortas.* The thoracic aorta has many branches to the chest.

The main artery of the lower body is the *abdominal aorta,* which supplies the abdomen and the organs contained in it with blood. It is a continuation of the artery called the *aorta* through the diaphragm into the abdomen, where it lies in front of the backbone, and behind the duodenum and coils of the small intestine. It descends as far as the fourth lumbar vertebra, where it divides and finishes its course as the two *common iliac arteries.* The branches of the abdominal aorta are numerous and important. They are divided into three sets: the *visceral* branches which directly supply the organs; the *parietal* branches which supply the diaphragm, and the intercostal and sacral regions; and the *terminal* branches composed of the two common iliac arteries which pass down the groins and carry the blood supply to the lower limbs. (*See also* HEART; ARTERY.)

APATHETIC.—To be affected with apathy or to be listless and without movement.

APERIENT.—Drugs or substances which produce a mildly purgative action on the intestine and lead to two or three soft motions of the bowels daily are called aperients or laxatives. The most useful drug in this class is cascara in some form. It has a very bitter taste, but can be had in small sugar-coated pills of various strengths, in a sweetened liquid form called cascara evacuant, or, if a purge is required, as cascara sagrada. A great advantage of cascara is that gradually increasing doses are not required, and the drug can be left off when no longer necessary without any bad effects. Various forms of health salts taken in a tumbler of water last thing at night or before breakfast make a very pleasant aperient. Where the bowel needs a lubricant, liquid paraffin is of great benefit and is obtainable in a great variety of forms. If the individual finds it impossible to swallow it in the form of a liquid, the jelly form can be easily swallowed with sips of orangeade or cold water. Vegetable laxatives such as psyllium seeds, linseed jelly, normacol and preparations of agar-agar, a seaweed found in Japan, are very useful for long-continued use. With many people fresh fruit juice or an increase of fruit and vegetable in the diet is an adequate aperient. A modern form of aperient is the use of certain glandular substances in preparations such as taxol and eulaxase.

APEX.—The summit or top of anything. When applied to the lungs, the apex of the lung is the top part behind the border of the first rib. The apex beat of the heart is the beat of the heart felt between the fifth and sixth ribs, about 3½ in. from the middle of the breast-bone. The apex beat may alter its situation in cases of enlargement of the heart and other conditions.

APHASIA is a defect in, or loss of, the power of expressing ideas by speech, writing or signs, or of understanding what is spoken or written. It is due to injury or disease of certain parts of the brain. These special parts of the brain which control speech are,

known as the speech centres, and in right-handed people they are usually situated on the left side of the brain, whilst in those who are left-handed they are generally found on the right side. The speech centres can be most easily explained by following the education of a child. The child first hears sounds, which after a time he associates with certain objects. Next, he ceases to be content to hear sounds, but wants to produce them. He succeeds in doing so by developing a part of his brain which is connected with movements of the tongue and lips (the "motor" speech centre). If this part of the brain becomes injured or diseased, the patient is unable to speak intelligently and the defect is called motor aphasia.

When the child learns to read and write, further centres are developed. First, written or printed characters have to be recognized; that needs one centre—the "seeing" speech centre. Afterwards they have to be reproduced; that needs another centre—the "writing" speech centre—which is developed in another part of the brain, close to that part of the brain which controls the movements of the hands. Further education makes even better communication between these various centres necessary. For example, in order to write from dictation, a message has to be sent from that part of the brain which deals with hearing, to the seeing speech centre and from there to the writing speech centre. In order that a child may be able to read aloud, a message must travel from the seeing speech centre, first to the hearing centre, and then to the motor speech centre. Thus, according to which centre is diseased or damaged, so will the type of aphasia vary. If the seeing centre is destroyed, then written language, though seen, conveys no meaning, and the patient is said to suffer from word-blindness. Motor aphasia has already been mentioned. If the hearing centre is damaged, the patient cannot understand what is said to him, a condition which is called word-deafness; but these conditions are uncommon. All these centres, though distinct, are situated close together in the brain, so that any disease which is at all progressive, like a hæmorrhage or a tumour, will in the end destroy all the speech centres, although in the case of a tumour, the way in which the speech defect first appears may enable the doctor to tell exactly where the tumour is growing. Because the speech centres are situated on the left side of the brain, in the majority of people, and this side of the brain controls movements on the other side, it follows that only disease of the right side will affect speech. This is important as it is often a help to be able to tell a patient who has had a stroke on the *left* side, that at any rate he need not fear that he will lose his speech. (*See also* APOPLEXY; BRAIN; NERVOUS SYSTEM.)

APHONIA.—Aphonia means loss of the power of speaking. The most usual cause of loss of voice is inflammation of the vocal cords, due to over-use or misuse of the voice. Teachers and public speakers are very prone to lose their voices for these reasons. The voicelessness may also be due to paralysis and sometimes to hysteria. (*See also* CLERGYMAN'S SORE THROAT; HYSTERIA.)

APOLLINARIS WATER.—A German alkaline mineral water highly charged with carbonic acid, making it very sparkling. It has been popular for a long time in the treatment of dyspepsia and rheumatism.

APOMORPHINE.—Apomorphine is made from morphine. It is the most powerful emetic known, and is largely used in the treatment of cases of poisoning. It is usually given by injection under the skin, and is almost certain to produce rapid and violent vomiting. It can be used in cases where emetics taken by mouth into the stomach would not act, and it has the advantage of not irritating the stomach. It is also used in cases of bronchitis, to loosen and bring up the thick expectoration.

APONEUROSIS.—A particular sort of tough, membraneous tendon which is attached to muscles, or encloses and binds down muscles.

APOPLEXY or STROKE.—A loss of consciousness with some paralysis, which is due to a sudden interference with the blood supply of part of the brain. It occurs most commonly in elderly people, in whom the arteries of the brain are inelastic, so that the blood tends to clot in them, thus cutting off the supply of blood from certain areas of the brain; or the walls of the arteries may be so weakened that they become fragile, and if any strain is put upon them they burst, giving rise to hæmorrhage. In younger people, in middle life, syphilis plays an

important part in producing apoplexy, as this disease causes certain changes in the blood-vessels, especially in the blood-vessels of the brain, which encourage clotting of the blood in the vessels, thus again cutting off the blood supply of part of the brain.

Apoplexy in people under forty is rare, but it may occur in one of two ways. In disease of the valves of the heart, sometimes a small piece of clot on one of the valves becomes broken off and is carried round in the blood circulation until it reaches a tiny vessel in the brain, where, unable to pass any further, it lodges, thus blocking the opening of the vessel so that no blood is able to pass along it. This cuts off the blood supply from an area of the brain, but in time, the lodged clot contracts, and the pathway for the blood is clear again. That is why in this form almost complete recovery is the rule unless the clot is a very large one, or the vessel in which it has lodged is itself unhealthy.

A few unfortunate people have arteries inside their skulls with thinner walls than usual at particular points, where the arteries divide into smaller and smaller branches. Gradually the arteries become stretched at these points, and some day, when the unfortunate person is making a bigger effort than usual, for example, running, or coughing hard, or indulging in a violent fit of temper, an artery will give way at one of these points and the person has a stroke. This type of stroke may occur at any age, and the person who has had such a stroke, although he may survive one or two even, may be said to be living on the edge of a volcano, since no one can prophecy when the next one will occur.

It must, however, be emphasized that this type of stroke in young people is rare, compared with the type seen in the elderly from blood clotting in an artery, or from bursting of a weakened vessel. The common type, that due to clotting of the blood, most frequently occurs when the apoplexy happens during sleep or under conditions of quiet. The history is often that the patient went to bed feeling extra tired, and next morning woke up and found that he was paralysed down one or other side. The exact symptoms and signs of such an apoplexy will depend on which artery has become obstructed, but a certain artery which supplies one particular region of the brain is nearly always affected, and when this area of the brain is deprived of its blood supply, paralysis of the opposite side of the body occurs. If the left side of the brain is damaged, then most probably speech will be lost, at least temporarily, as this side of the brain controls speech, but if the right side of the brain has suffered, then speech will be preserved.

When apoplexy is due to blood clotting and not to bleeding from a burst vessel, unconsciousness may be only slight, and the patient may recover consciousness within a few hours. Where bleeding has occurred, unconsciousness is much more severe; it is prolonged, and the patient very often passes into a coma from which he does not awaken, the fact that this fatal coma is due to hæmorrhage in the brain being determined from an examination of the patient's eyes and limbs. On the side of the paralysis, that is, on the side opposite to the hæmorrhage, the pupil of the eye is very large, and does not get smaller when a bright light is thrown into that eye. Although the patient is breathing noisily and hurriedly and puffing out his cheeks, it can readily be seen that on the side of the paralysis the cheek is less puffed out at each breath than it is on the sound side. And even though a patient be deeply unconscious it is possible to show that the limbs on the paralysed side when raised, and allowed to fall again, do so " all of a piece," in a more lifeless manner than upon the sound side.

Deepening of unconsciousness after the stroke has occurred usually foretells a fatal ending. It may be stated that whereas hæmorrhage into the brain is almost invariably fatal, except in those cases which have already been referred to, in which recovery may take place from one or even two small hæmorrhages, a good deal of recovery in the paralysed limbs may take place from an apoplexy due to clotting of the blood in the vessels. The outlook for complete recovery depends on many factors, especially on the condition of the blood-vessels and heart. *Re-education* of the paralysed limbs as regards movements is of the utmost importance, and the patient should be urged to try to move his paralysed limbs as much as possible, as soon as he is completely conscious. There is no fear that by moving the limbs he will bring on another

stroke. Many patients who have had one stroke caused by clotting of the blood in a vessel go for many years without another and finally succumb to a hæmorrhage that is rapidly fatal. The best preventive measure against a stroke in those who are known to have bad arteries is moderation in all things: in diet, alcohol, physical and mental exercise.

APOTHECARIES' WEIGHTS AND MEASURES.—This is a system of weights and measures used in the making-up of medicines. The troy pound of 5,760 grains is the standard; it is subdivided into 12 ounces of 480 grains each. The ounce is subdivided into 8 drachms or drams, the drachm into 3 scruples, and the scruple into 20 grains. For fluid measure the quart of 32 fluid ounces is subdivided into 2 pints, the pint into 16 fluid ounces, the ounce into 8 fluid drachms or drams, and the fluid drachm into 60 minims.

Apothecaries' Weight.

Grains.		Scruples.		Drachms.		Troy Oz.		Pound
20	=	1						
60	=	3	=	1				
480	=	24	=	8	=	1		
5,760	=	288	=	96	=	12	=	1

Apothecaries' Measure.

Minims.		Fluid Drms.		Fluid Oz.		Pints.		Gallon
60	=							
480	=	8	=	1				
7,680	=	128	=	16	=	1		
61,440	=	1,024	=	128	=	8	=	1

For domestic use the measures given below may prove a valuable help.

A teaspoonful is rather over a fluid drachm.

A dessertspoonful is about two fluid drachms.

A tablespoonful is about half a fluid ounce.

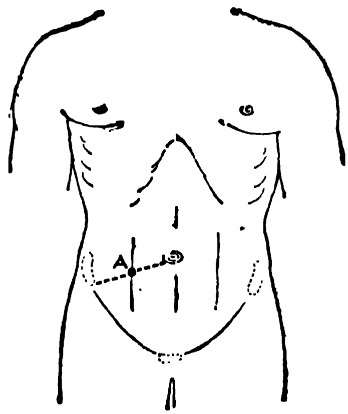
A wineglassful is about one and a half to two fluid ounces.

A teacupful is about five fluid ounces.

A breakfastcupful is about eight fluid ounces.

A tumblerful is about eleven fluid ounces.

APPENDICITIS.—Inflammation of the appendix, a small worm-like projection from the cæcum, or blind end of the commencement of the large intestine. The cause of appendicitis is not definitely known. In most cases it appears to be due to invasion of germs, such as streptococci, etc., which enter the appendix from the intestine, or in other cases it may be due to germs from a distant source of infection such as the tonsils, or teeth. These latter are blood-borne, i.e. they travel in the bloodstream from some distant part of the body to the appendix. Some cases are said to be due to internal obstruction of the appendix by lumps of hardened fæces, pips and skins of fruit, thread worms in masses, and swallowed foreign bodies. In one such case a gold link of a bracelet was found neatly tucked away inside the appendix. External obstruction from adhesions and bands may also cause appendicitis. It is on the whole a disease of youth and middle-age; males are attacked



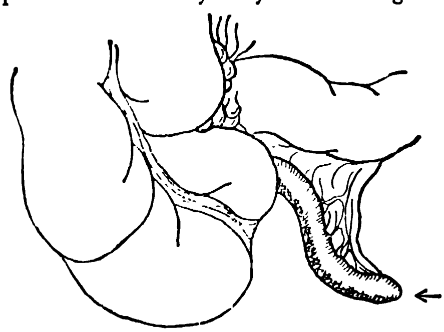
Appendicitis:
A McBurney's Point

slightly oftener than women, and it is more common amongst civilized races.

Appendicitis is a disease which comes on in definite attacks with, usually, a pain-free interval between them. In the typical attack the patient has been out of sorts for some days and begins to complain of attacks of pain of a griping character in the right side of the abdomen or round the umbilicus (navel). On walking the pain may be of a stabbing nature and be felt in the right groin. There may be vomiting, constipation or diarrhœa. The temperature rises and the pulse is rapid. There is a well-marked tenderness in the region known as McBurney's point. To find this tenderness for oneself, place the thumb of the right hand on the umbilicus and the little finger on the point of the hip; if the middle finger is now pressed down it should be approximately in the region of McBurney's point. An appendix which is causing symptoms

should always be removed, as the condition rarely cures itself, and the results of neglect are so serious. The chief danger is that the swollen appendix may burst or perforate and flood the abdomen with poisonous matter, which will rapidly set up peritonitis and may be rapidly fatal. After repeated attacks the appendix may become gangrenous, and each attack will add to the number of adhesions in the abdomen and the severity of the operation for the removal of the appendix. Appendicitis is often the original cause of diseased conditions higher up the alimentary track such as gastric or duodenal ulcer, inflammation of the gall-bladder, etc.

In an acute attack of appendicitis the patient is obviously very ill and in great



Appendix

pain, and no time should be lost in sending for the doctor. *No aperient should be given* as is sometimes done under the impression that the case is one of colic due to constipation.

Appendicitis is a not infrequent accompaniment of pregnancy, and if diagnosed early in the pregnancy should be operated upon, as the condition will be much more dangerous towards the end of the pregnancy, and a perforation would be more than usually dangerous.

APPENDIX.—The vermiform appendix, or appendix as it is more usually called, is a relic which probably has no definite use in modern human beings. In animals such as the rabbit or horse, which feed entirely upon vegetarian matter, it is large and appears to be of some importance, whereas in meat-eating animals like the lion and tiger, it is even more minute and shrivelled up than in human beings who live on a mixed diet of flesh and vegetables. In shape it is tubular, attached at one end to the cæcum, into which it has a small opening which is protected by a valve. The other end swings free, but is usually adherent to the cæcum or some part of the lining of the abdomen. In length appendices vary from 1 to 10 in., the average being 3 or 4 in. in length. The position in which the appendix lies varies also. About half the number point straight upwards and lie either behind the cæcum and ascending colon, or to the right of them. This is called the retrocæcal or extracæcal position. Others run upwards and inwards, pointing towards the spleen, and others again, known as the pelvic appendix, hang straight downwards from the cæcum into the pelvis. The length and position of the appendix exert a considerable influence upon its liability to infection, and the other organs that will be affected by its inflammation. (*See also* APPENDICITIS; INTESTINES.)

APPETITE.—Everyone who enjoys good health should be blessed with a good appetite. It is the natural function of the body to require nourishment, and the craving which this function sets working is known as appetite. The sight and smell of food very often increases the flow of the gastric juices within the body, thus giving an added zest to the appetite. In the same way, a meal, badly cooked and served, will often have the effect of taking away the appetite altogether.

When the health is normal and the body is functioning properly, it is a very good thing to eat such foods as one may fancy. The body generally knows what is good for it and what it can deal with. It is only when the body is physically out of order that the appetite becomes poor, and the normal diet no longer suitable. Among the more common causes of loss of appetite are constipation, too little exercise, abuse of alcohol or tobacco, and many other causes including diseases of the body.

In people who lead a sedentary life it is not to be expected that the appetite should be as good as in those who are out of doors all day long. A brisk walk before meals will increase the appetite and probably make food taste twice as good.

Sometimes an unusually good appetite may be a symptom of gastric catarrh, and in cases of duodenal ulcer pain is always most severe when the patient is hungry. This

symptom is known as " hunger pain " and it is usually relieved by the taking of food. In acute fevers the appetite invariably disappears altogether, and it is usually very poor in cases of tuberculosis and anæmia.

Much can be done to improve the appetite by the taking of " bitters." Substances such as calumba, gentian, and quassia are very often used to increase the appetite and aid digestion. Their action tends to increase the flow of saliva and gastric juices. Some people have the pleasant habit of indulging in an aperitif before meals. This not only increases the appetite, but when taken in the company of other people, tends to brighten the mental outlook and produce a feeling of well-being which should accompany the function of eating; but it is unnecessary and indeed harmful for the young. (*See also* SUPPLEMENT ON DIET AND INVALID COOKERY.)

APPLE.—Apples have always been a popular fruit, and the well-known saying "an apple a day keeps the doctor away" may not be literally true, but nevertheless it indicates that apples are good medicine. Not only do they provide material to help to keep the bowels regular, but they are an excellent way of keeping the teeth clean. In these days of extensive fruit diets, the apple should provide a fair proportion of the meal; but, of course, any fresh fruit is wholesome as long as it is ripe and in good condition. Unripe apples should be avoided, especially by children, as they tend to produce indigestion.

ARACHNOID MEMBRANE.—The delicate membrane of the brain, so called because of its resemblance to a spider's web. (*See also* BRAIN.)

ARCUS SENILIS.—The opaque ring that appears at the edge of the iris or coloured part of the eye, usually to be seen in elderly persons. If this ring makes its appearance in younger people, it is usually an indication of premature old age or senility.

The first of these terms means "the bow of old age," and the second "old age poisoning of the cornea," and it is a condition that occurs in the eye as age comes on. It first starts as a semi-circular, greyish-white opaque line in the upper part of the eyeball. A similar line forms in the lower half of the cornea, and the two gradually make their way along to meet each other, and form a complete ring. This ring is composed of fatty tissue. The condition, however, is perfectly harmless and, indeed, normal to advancing age, and when the ring has once formed it proceeds no further. The eye does not appear to be affected by its presence; and if injury occurs, the fatty tissue heals just as well as the normal tissue of the eye. It is sometimes found in quite young people, especially those suffering from rheumatism. (*See also* CORNEA; EYE.)

ARECA.—A species of East India palm. Areca catechu has been cultivated throughout the tropics of Asia from the earliest times. It furnishes the betel-nut which is used as a masticatory, that is, to encourage chewing. A few grains of the nut are rolled up with a small amount of quicklime in a leaf of Piper betel, and chewed. It is tonic, stimulant, and aphrodisiac, and seems to increase the powers of endurance.

AREOLA.—The brownish space surrounding the nipple of the breast. During pregnancy a second areola occurs, surrounding this. Areolar tissue is the medical name for any loose tissue that lies beneath the skin, and which goes to fill up all the odd corners of the body. (*See also* BREAST; NIPPLE.)

ARGYRIA (Greek: argyros, silver).—This condition consists in the staining of the insides of the eyelids as a result of prolonged use of, or exposure to, silver. Any silver preparations, especially silver nitrate, applied as drops; or the use of silver internally in disease; or exposure in the course of work to an atmosphere impregnated with silver, will produce the condition. In the two last cases the entire skin is also stained. The colour is a greenish or brownish grey, and in the eye the lower part is seen to be more stained than the upper. All these conditions were formerly far more common than at present, though staining of the conjunctiva is still fairly frequently seen. It is permanent, and no treatment affects it in the least.

A form of temporary staining of the conjunctiva may be mentioned here: that caused by a particle of "lead" from an eyebrow pencil entering the eye. This may cause serious trouble, even to loss of the sight. (*See* INJURIES OF THE EYE.)

ARGYROL.—Argyrol is a silver proteinate containing 20 to 25 per cent. of silver. It is used a great deal in the treatment of eye and nose and throat affections, and is especially useful in gonorrhœal conditions.

ARM.—The arm is properly the upper extremity from the shoulder to the wrist, but the part from the elbow to the wrist is sometimes called the forearm. The bones of the arm are the humerus, the large bone in the upper arm, and the ulna and radius in the forearm. The scapula or shoulder-blade does not belong to the arm. The humerus consists of the long shaft and a head and end. The head is well rounded and fits snugly into the concave end of the scapula, forming a ball-and-socket joint at the shoulder. At the elbow, which will be described separately, the humerus connects up with the radius, on the outer or thumb side of the limb, and the ulna on the inside. These two bones touch at the upper and lower ends, but curve slightly away from each other in between. The arm is moved by muscles coming from the shoulder-blade, the collar-bone and the main trunk of the body. They are the coraco-brachialis, the biceps, the brachialis anticus and the triceps. The blood-supply is conveyed to the arm by the brachial, radial and ulnar arteries. (*See also* ELBOW; WRIST.)

ARMPIT.—The armpit or axilla is the space between the upper part of the wall of the chest and the upper part of the arm. The important nerves and blood-vessels going to the arm are near the surface in the armpit, so it is a dangerous part in which to have a cut. Care must be taken, too, that where crutches are worn they are well padded and do not press unduly in the armpit, or paralysis of the nerves of the arm may occur, a condition which is known as *crutch palsy*. The glands of the armpit are liable to abscesses (axillary abscess) which may be very troublesome to heal. It must not be forgotten, too, that the glands of the armpit enlarge in cases of chronic inflammation or cancer of the breast, and should they be found to be enlarged should be seen by a doctor. It is very important to attend carefully to the cleanliness of the armpit, as sweat is profuse there, and if unattended to may cause an unpleasant odour. (For difficulties of this sort, *see* BEAUTY CULTURE; SWEAT, ANOMALIES OF.)

ARNICA.—Tincture of arnica is often used for bruises and injuries, but it may produce dangerous rashes and should never be used if the skin is broken. If used, and irritation of the skin is produced, doses of health salts should be taken and a sedative ointment should be rubbed into the skin until the rash subsides.

AROMATIC.—This term is applied to any substance having a fragrant, spicy taste and odour. They include cinnamon, ginger, peppermint, aniseed. Many aromatics are used to flavour medicines, but in addition, they are useful in the treatment of flatulence and indigestion.

ARRHYTHMIA.—Absence of rhythm, irregularity of the heart's beat. This irregularity may be due to serious heart disease, but may also be constitutional and of no importance. It is fairly common in young adults and may cause no symptoms and only be discovered accidently. This form requires no treatment.

ARROWROOT.—A variety of starch derived from Maranta arundinacea of the West Indies, southern United States, etc. When cooked it is a very popular food for invalids. It should be supplemented by milk and eggs, and other ingredients if necessary. A dessertspoonful of arrowroot should be placed in a teacup and thoroughly mixed with a small quantity of milk or cold water till quite smooth. Then add by degrees half a pint of boiling milk, continually stirring the mixture. Sugar may be added, or a teaspoonful of brandy, or it may be flavoured with lemon peel if desired. (*See also* SUPPLEMENT ON DIET AND INVALID COOKERY.)

ARSENIC.—Arsenic is a brittle, crystalline metal which, in various forms, is used a great deal in medicine. As it is a highly poisonous substance, it should never be taken internally except under medical supervision. This drug is contained in many preparations sold for agricultural purposes, such as sheep-dip, weed killers, and insect destroyers, and many deaths have occurred through the careless handling of these preparations.

In medicine it is given internally as a general tonic and nerve tonic, and it is used in the treatment of anæmia, diabetes, malaria, and for chronic skin diseases. One peculiarity of arsenic is that it may be found many years after death in the bodies of those who have taken it during life.

Poisoning by Arsenic.—Cases sometimes occur in which a patient who has been given arsenic as a medicine may show slight symptoms of poisoning. These are nausea, slight vomiting, loss of appetite, abdominal

pain, and mild diarrhœa. The eyes and nose may water and there may be headache. These symptoms often occur in workers who handle arsenic in the manufacture of various articles, especially wallpapers and fabrics. Long-continued use of arsenic may cause peripheral neuritis, the chief symptoms of which are paralysis of the muscles of the limbs accompanied by darting pains, herpes zoster, and rapid muscular atrophy.

In cases of acute poisoning, the onset of symptoms is very rapid. Vomiting occurs and is brown in colour and often streaked with blood. There is profuse diarrhœa and the abdominal pains are very severe. The throat becomes parched and there is an acute burning sensation; there may be cramp in the calves of the legs. The skin usually becomes cold and clammy and the pulse becomes feeble and the patient dies of collapse.

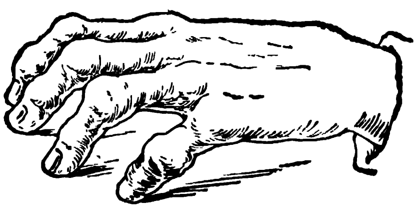
Treatment consists of washing out the stomach thoroughly and emetics should be given. Large amounts of magnesia should be administered or large doses of castor-oil and water. The patient should be kept as warm as possible with hot blankets, and hot-water bottles to the feet and abdomen; hot coffee may be given.

ARTERIO-SCLEROSIS.—The term means hardening of the arteries, but the name is now commonly applied to the general condition of a patient in whom this hardening of arteries has occurred. In late middle life, or early old age, the elastic walls of the arteries, which are chiefly composed of muscle, begin to stretch as elastic does when it begins to wear out. In order to repair the elastic, as it were, fresh muscle is formed in the walls of the arteries, but this muscle is of an inferior quality to that which the individual was born with, and it soon breaks down (or degenerates, as it is termed), leaving the walls of the arteries weaker than before. Most of the symptoms of arterio-sclerosis are due either to this weakening of the walls of the arteries in the various organs of the body, or to bursting of a blood-vessel, the final result in many cases of the weakened wall. Whether a person suffers from arterio-sclerosis or not depends on many factors, but there is no doubt that the most important one is the quality of the arteries he inherits. If the muscular walls are of good quality in the first place, it is likely that unless he commits grave excesses in the way of eating and drinking whilst taking insufficient exercise, or is the victim of some kidney trouble, he will escape all but the mildest symptoms of the condition. If, on the other hand, there is a family history of bad arteries, several members of the family having died of strokes or of kidney trouble, care is necessary from youth upwards in the way of avoiding overeating and hard drinking and excessive smoking. The muscular wall of the heart shares in the general thickening of the arteries and many symptoms are due to this cause. It is in this condition that the blood-pressure becomes very high, and kidney disease is liable to occur. One of the early symptoms is having to pass water more than once during the night. Dyspepsia and constant, though not severe, diarrhœa are also early symptoms which are often disregarded. Headache, of a throbbing and bursting character, generally felt in the back of the head, is constantly complained of, whilst giddiness, a full feeling in the head and noises in the ears are very common symptoms. In many cases patients complain that they are unable to walk more than a few steps in comfort, not because their legs have no power, but on account of the severe cramps in the legs they get after taking a few steps. These cramps are due to the muscles of the legs being deprived for a short time of the amount of blood they require for their work, owing to spasm of the arteries of the legs, which are not allowing the right amount of blood to flow through them.

More severe symptoms may show themselves in the form of diminution of vision, shortness of breath on very slight exertion, vomiting and very intense headaches. The desire to pass water frequently at night increases, but little is passed at a time. In the worst cases, death results either from bursting of a blood-vessel in the brain, giving rise to one form of apoplexy, or from failure of the kidneys to carry out their proper functions. The fate of the patient with arterio-sclerosis really depends on the extent to which the arteries in his kidneys have suffered in the general arterial disease. This knowledge can be gained from an examination of the urine, an examination which may have to be repeated more than once in order to estimate the amount of damage done to the kidneys through disease of their arteries.

That examination and an examination of the blood pressure are looked upon as absolutely necessary in the case of any patient who is suspected of having arterio-sclerosis, and can, of course, only be made by a doctor.

Treatment.—The treatment of the condition, while it obviously cannot restore the lost elasticity of the arteries, can do much to rid the patient of his troublesome symptoms. Moderation in food and drink is essential and a meatless diet is recommended. Spirits and heavy wines are not allowable and heavy beers are decidedly bad for such patients, but light wines and ales are permissible. Regular exercise of not too strenuous a nature is advisable, walking being one which is often neglected. It is of the greatest importance to ensure regular action of the bowels, and in cases with a high blood pressure, the use of a brisk purgative pill once a



Arthritis, showing arthritic joints of finger

week and a dose of health salts each morning. This "mild dose of salts," has much to recommend it. Patients with arterio-sclerosis should be kept as free from worry as possible, and in bad cases should be urged to "take things easily" as there is always the risk of worry or anger bringing on the dreaded final hæmorrhage into the brain.

ARTERY.—The arteries are the tubular vessels which convey the blood from the heart to the tissues. They are composed of three coats: the outer coat is of fibrous tissue amongst which are elastic fibres; the middle coat is composed of muscular fibres; and the inner coat has a smooth inner surface. The arterial system of the body has been compared to a tree, the trunk of which is the main artery called the aorta, whilst the smaller arteries branch off at intervals to the different limbs and organs of the body. They, in their turn, have smaller arteries branching off them. The aorta being the largest and therefore most important artery, is buried deeply in the middle line of the body. The joining together of two arteries is called an anastomosis. The aorta and its dependent arteries convey the blood from the lungs to the tissues of the body and are called the arteries of the systemic circulation. The pulmonary artery conveys the bad blood to the lungs to be mixed with oxygen, and is the main artery of the pulmonary system. The main arteries of the body are the aorta, the pulmonary, the innominate, right and left subclavian, common carotid, axillary, brachial, radial ulnar, iliac, femoral, anterior and posterior tibial. These will be described under separate headings.

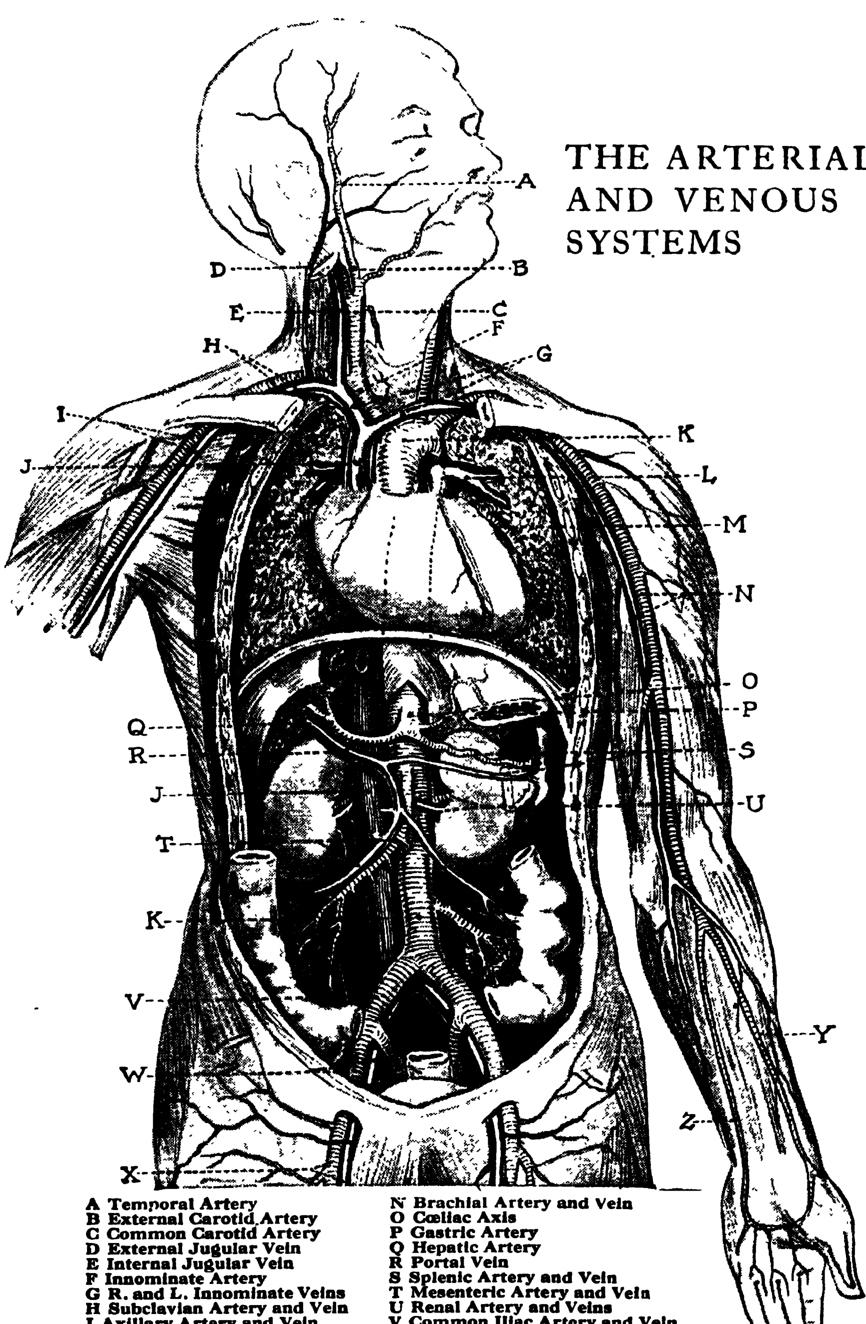
The cutting of an artery by accident or design gives rise to profuse and dangerous bleeding, with bright red blood. Arteries themselves are liable to become hardened in various ways and to lose their elasticity. This condition is known as arterio-sclerosis. It is usually accompanied by the condition known as "high blood-pressure," and renders the arteries liable to break. Aneurysms also occur in unhealthy arteries.

ARTHRITIS.—Inflammation of a joint is called arthritis. The condition is thought to be due to the poisons let loose in the blood by germs, especially by certain sorts of streptococci and *b. coli.* There is usually a pocket or focus of infection somewhere in the body, often in the teeth, tonsils, nose, intestines, or genito-urinary tract. Any factors which lower the resistance of the body to infection, are likely to be causes of arthritis. These may be cold and damp, faults of diet, glandular deficiencies, etc. A fuller description will be given under the titles rheumatoid arthritis, osteoarthritis, spondylitis deformans, and Still's disease.

ARTICULATE.—The ordinary meaning of the word articulation is to speak distinctly and clearly. In medical language it means the joining up of joints. An articulated skeleton, such as we see in museums, is one that has been prepared and so arranged as to leave free movement of all the joints.

ARTIFICIAL LIMBS.—An artificial limb is, as its name implies, an apparatus designed to replace a limb which has been cut off, either by accident, or by operation because of disease. To be useful the artificial limb must be able to copy as well as possible the working of the natural limb. It must fit comfortably and firmly so that there is no unnecessary pain, or any interference with

THE ARTERIAL AND VENOUS SYSTEMS



A Temporal Artery
B External Carotid Artery
C Common Carotid Artery
D External Jugular Vein
E Internal Jugular Vein
F Innominate Artery
G R. and L. Innominate Veins
H Subclavian Artery and Vein
I Axillary Artery and Vein
J Vena Cava
K Aorta
L Pulmonary Artery
M Pulmonary Veins
N Brachial Artery and Vein
O Cœliac Axis
P Gastric Artery
Q Hepatic Artery
R Portal Vein
S Splenic Artery and Vein
T Mesenteric Artery and Vein
U Renal Artery and Veins
V Common Iliac Artery and Vein
W External Iliac Artery and Vein
X Femoral Artery and Vein
Y Radial Artery
Z Ulnar Artery

the other parts of the body. It must be light in weight, but strong enough to bear the weight which will be put on it, if it is a leg. If it is an arm it must be able to grasp objects in various ways and hold them for a long time if necessary. These requirements may sound almost impossible to attain, but such has been the advance in the skill with which these limbs are made since the war that a useful comfortable limb can be obtained by almost everyone who needs it. They are expensive to make, of course, but there are various funds from which the needy can obtain assistance.

Duralumin.—Artificial limbs are usually made of wood or metal, or of a mixture of both. Until recently wood was found lighter than metal to make them of, but now a metal material has been discovered which combines the strength of steel with the light weight of aluminium. This metal is called *duralumin* and is a mixture of aluminium and other matters. Its discovery has revolutionized the artificial limb industry, and has made the all-metal limb, with its superior advantages, a very satisfactory article. Metal has many advantages over wood in the manufacture of artificial limbs. It is possible to hammer metal to fit, which cannot be done with wood. The metal leg is several times lighter than the wooden one and is also practically indestructible. Duralumin legs will not rust or tarnish and are not affected by sea water.

Artificial legs.—A good artificial metal limb should only weigh about 3 lbs. The ankle can be made either flexible or stiff, and the limb is made so that if a part breaks it can be replaced. The movements of a natural leg are copied so that by a powerful elastic strap the knee bends into the sitting position when required. A spring is introduced into the ankle part of the limb so that there is a slight spring in the walk as there is in the natural walk. Artificial legs are so successful nowadays that when the wearer gets used to his apparatus he can walk and sit down in the normal manner and can even play games as energetic as tennis.

Artificial arms and hands.—In the case of the arms and hands it is more difficult to make up for the intricate movements which the fingers and hand are capable of, but the thumb can be separated from the rest of the fingers by means of a strap passing round the back part of the shoulders. A "hunching" movement of the shoulder will pull on the strap and thus open and close the joint of the thumb. For craftsmen it is possible to have different varieties of artificial hands most suitable for their particular trade, such as a good "holding" hand for metal work and so on.

Schools for the re-education of limbs.—It was Napoleon who first ordered the establishment of special schools for individuals who had had a limb amputated, but it was not until after the European War had finished in 1918 that any real progress was made. The schools occupy themselves with the training of limbs where it is not possible to wear artificial substitutes, and in cases where artificial limbs are worn, they help the maimed individual to obtain the best use of them, and advise him in the choice of a suitable occupation. Notes as to the efficiency of the mechanical limb can be made out, by which a prospective employer can tell just how much the limb detracts from the person's usefulness.

Where a right-handed individual loses his right hand he is taught to use the left, and to use the artificial hand on the other side for holding purposes. This re-education takes on an average from three to four weeks.

Sensations in amputated limbs.—A curious thing that happens after a limb has been lost is that the patient may for several months, or even for years, have the feeling that the limb is still present, and may feel that he has the power of moving and bending it. These people also continue to feel sensations that were formerly present, such as painful feelings in the fingers or toes. These feelings are hallucinations, that is, they have no real origin in fact, but are present only in the mind, and are due to irritation of the nerve endings in the fleshy part of the stump. They are dangerous, however, besides being painful, because they appear so real to the individual that he may try to walk on a leg that is not there.

Fortunately these sensations are not usually permanent, and disappear more rapidly if re-education of the stump is undertaken. They rarely last after work has been begun again.

ARTIFICIAL RESPIRATION.—Artificial respiration means artificial breathing and has

to be used in cases where the heart is strong and undiseased, but the breathing has been stopped by some such reason as an accident, or drowning. In these cases the heart goes on beating for a short time after the actual breathing has stopped, and it artificial respiration. The heart, as has been said above, continues to beat after breathing has stopped and artificial respiration, therefore, tries to imitate as far as possible the movements of breathing.

Shafer's Method.—This is the method in

ARTIFICIAL RESPIRATION

Shafer's Method.

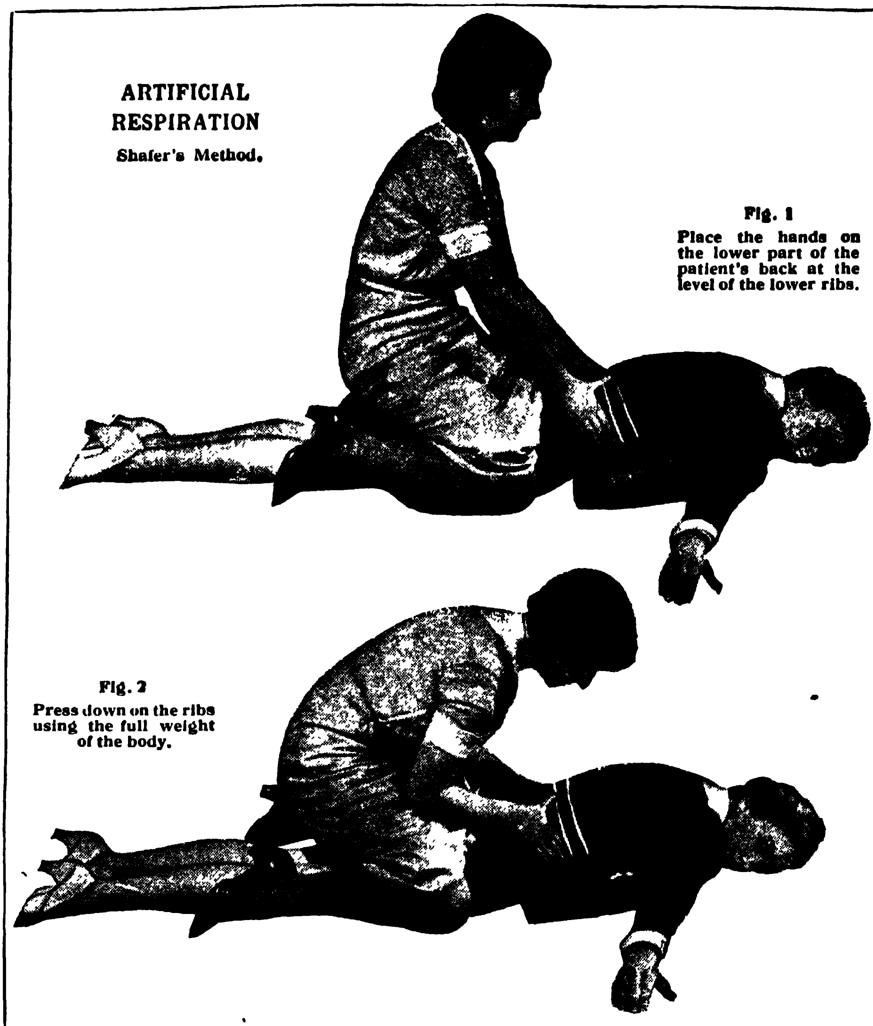


Fig. 1

Place the hands on the lower part of the patient's back at the level of the lower ribs.

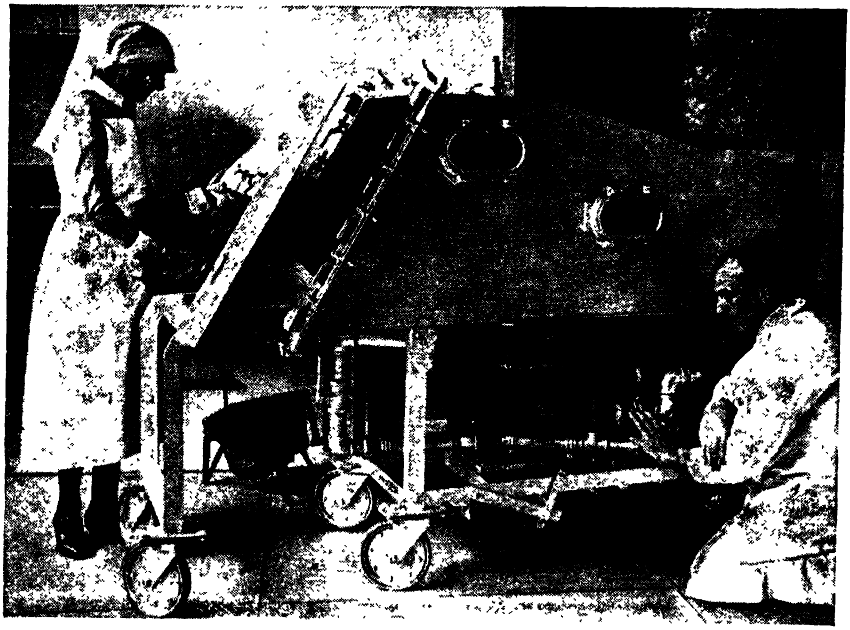
Fig. 2

Press down on the ribs using the full weight of the body.

happens in the majority of cases that if artificial respiration can be employed at once, the heart will continue beating and the breathing will be restored. For this reason it is very desirable that all able-bodied adults who mix much amongst their fellow-people should have a working knowledge of one or other of the means of performing most general use. If practised a few times on healthy normal people its movements will return readily to the mind when an emergency arises and something has to be done in a hurry. It is described in the First-Aid Supplement, but to make this article complete for those who are interested in the subject it will be as well to describe it over again.

Place the patient on the ground, face downwards, with a coat or cushion under the lower half of the chest. Turn the patient's face sidewards in such a way that the nose and mouth are clear of any obstruction such as sand if it is on the beach. Kneel astride of the patient or to one side facing his head. Place the hands on the lower part of the patient's back on each side at a level of the lowest ribs. In this position press down on the ribs, using the full weight of the body in the downward pressing movement. Air and water (if the case is one of drowning) will then gush from the patient's mouth. At the end of the downward movement withdraw the hands. Repeat this movement twelve or fifteen times a minute and continue for at least half an hour; if other competent people come up they may take turns. All artificial respiration is very hard work for those who are not in the habit of doing it regularly. In this method no attempt is made to imitate the indrawing movements of breath-taking, only those of expelling air, the lungs themselves do the rest by expanding again naturally and of their own accord. Shafer's method is the system most generally used nowadays when there is only one person available to render first aid.

Marshall Hall's Method used to be much more used than it is now, but a knowledge of it is still valuable because, as in other conditions, one method may succeed where another fails. It is a very simple method. A prop at least six inches high is placed under the patient's chest while he is lying face downwards on the ground. This prop may be made of a roll of coat, or even stone or wood in the absence of anything else. The position of the operator is the same as in Shafer's. With the same movements as in Shafer's method, press on to the back to expel air, then take the patient by the shoulders and firmly roll him over on one side in order to allow the lung to expand. Replace on the face again and repeat the pressing movement to expel air. Take care that the patient is turned on the same side each time and keep the support under his chest. Repeat both movements alternately about fifteen times a minute. The value of this method is that one lung will clear and recommence breathing sooner than two, and as soon as any measure of natural breathing is re-established the battle may be said to be almost won.



Artificial Respiration Chamber used in Hospitals

Silvester's Method.—Where helpers are available Silvester's method is a useful one.

The patient lies on his back in this method. With the patient on his face, first repeat a few minutes of Shafer's method to free the lungs of air and water. Then turn the patient on his back with a support under his shoulders, a roll of clothing being sufficient. If a slight incline, with the patient's head higher than his feet, can be arranged, so much the better. To keep the throat clear the tongue must be pulled forward out of the mouth, and it may be necessary for someone to hold it there by means of a cloth or forceps if they are at hand.

Kneel at the patient's head, and grasp his arms just above the elbows. Draw them upwards to the side of the head, keeping them there while two can be counted; this represents "breathing in." Next bend the patient's elbows, let them down and press them into the patient's chest while two can be counted. This imitates "breathing out." Repeat the two movements alternately at the rate of fifteen series to the minute. The patient's feet are better to be held steady by another helper, and the tongue must be kept from falling back in the mouth and thus blocking the throat.

These three methods are the recognized ways of applying artificial respiration, which can be undertaken by amateurs. Trained people, like ambulance men, use these methods too, but can also execute more intricate ones such as *Howard's Method*, but such methods would be dangerous if performed by any but highly trained persons.

The procedure of artificial respiration is planned to copy the natural act of breathing or respiration, and its usefulness is over as soon as the patient begins to breathe of his own accord again. When this happens stop all the movements, but be ready to begin again if the breathing stops again, as it frequently does. Efforts to restore the breathing should be carried on for at least an hour before hope is given up and, if it can be managed, an even longer time may still bring success. There are cases on record where breathing has started again after several hours.

In some hospitals there is a machine designed for cases where artificial respiration must be kept up for long stretches at a time. The cases for which it is useful are not so much accident cases as cases where the breathing fails owing to paralysis, as in some very bad cases of the disease called infantile paralysis. The whole body of the patient except the head is enclosed in this "life-saving machine."

It may be necessary, and in fact very often is necessary, to practise artificial respiration on a new-born baby, in order to start it breathing for the first time. The way to do this is described under the heading ASPHYXIA.

ARTIFICIAL SUNLIGHT.—For a full account of treatment by artificial sunlight and its different rays, ultra-violet, etc., *see* LIGHT TREATMENT.

ARYTENOID.—This term is used to refer to two small pieces of cartilage or gristle, which are placed at the back of the larynx or voice box, and to which the vocal cords are attached.

ASAFŒTIDA.—A very disagreeably smelling gum-resin obtained from the root of a plant called Ferula fœtida. Its properties are due to an oil which gives it a characteristic unpleasant odour. It is used in cases of hysteria and other mental disturbances, and it is extremely nasty to the taste.

ASCARIS.—A species of parasitic worm which inhabits the intestine of most animals. The ascaris lumbricoides, or the roundworm, is a variety which is found in the intestine of animals and man, especially young children. (*See also* WORMS.)

ASCITES.—The name given to the collection of fluid in the abdomen in dropsy. This fluid is non-purulent, that is, it does not contain pus. It is generally the result of heart or kidney failure or cirrhosis of the liver, but may also be found in diseases which cause pressure such as tuberculosis, cancer, aneurysm or thrombosis.

The patient with ascites complains of enlarged belly, heavy feeling and discomfort. The legs swell and the patient is breathless and perhaps has palpitations.

Ascites is a serious condition, or at least the symptom of a serious condition, but where it is due to heart failure it will improve when the heart condition improves. The amount of fluid taken during the day should be strictly limited, not more than a pint to a pint and a half being taken in the day, and an attempt should be made to increase the amount of urine passed, medicines employed for this purpose being called *diuretics*. Salt should be left out of the

food as much as possible. In extreme cases of ascites it may be necessary to have the abdomen "tapped" as it is called, and the fluid drawn off. (*See also* DIURETICS; DROPSY.)

ASEPSIS.—"What can we do for this poor man?" a famous surgeon used to ask his students as he went his round in the hospital ward. And when he had done all he could to make the patient—man, woman or child—comfortable, he would settle the pillows himself, and ask with the kindest smile, "Now are you quite comfortable?" So gentle was he, so anxious that all his patients should get on well and be happy, that once, when a little patient in a hospital bed held up her doll with a broken leg, trusting that one so good to children would mend it, he asked for needle and cotton, gravely sewed up the leg, and handed it back to its "mother" without a word, but with that smile that children loved and understood.

It grieved this gentle, kindly man to see so many people suffering, and even dying, from a mysterious kind of fever, so common in those days—nearly a hundred years ago—that it was known as "hospital gangrene." It would particularly attack people who had had operations; and one doctor, himself a student of the great surgeon's, who afterwards wrote his *Life*, tells us that one in every three or four used to die of it after big operations. It was a puzzle to the whole medical profession, and young doctors were warned to get their patients out of the wards as quickly as possible. Naturally, people were frightened of going into hospital at all, for fear they would not come out alive.

What was it? Some thought it was the old buildings of those days, perhaps with bad drainage or none, overcrowding, lack of fresh air and other defects, and Florence Nightingale, the founder of modern nursing, once described an old hospital building as "a pest-house where a number of people are exposed to the risk of fatal illness by a special hospital disease."

It was the famous surgeon who mended the broken doll who attacked the real cause—germs entering the wound after operation. His is a name that should be remembered by everybody—Joseph Lister, the famous Lord Lister who died at the age of eighty-five two years before the beginning of the World War. He first prevented the entry of germs into wounds by his famous carbolic spray, and from his work has come what we know as modern hospital methods of "surgical cleanliness," that is to say, the modern operating theatre with its rounded corners and enamelled walls, the shaving and painting of the patient's skin, covering with sterilized towels, the careful washing of the surgeon's and nurses' hands, and the wearing of rubber gloves, sterilized overalls, caps and masks—all with the object of keeping the wound free from germs.

How did Lister know about the germs? Lister's great work would not have been possible unless it had been proved that germs do enter wounds and cause blood-poisoning; and it was Louis Pasteur, the great scientist, the son of a French tanner, who showed that germs caused fermentation, and Lister—from the analogy of fermentation with inflammation—who suspected and eventually proved the cause of inflammation and sepsis. The object of "Pasteurization" of milk is to free it from germs, by heat.

These two great men, Pasteur and Lister, brought fresh hope into the hearts of millions by making operations safe through cleanliness, and laid the foundations of modern hospital methods. It is nice to know that these two great men met. At a gathering of scientists from all over the world on Pasteur's seventieth birthday, December 27, 1892, Lister was there to do honour to his French colleague, and Pasteur went down from the platform and led Lister up and publicly embraced him, while the delegates wept with emotion, realizing the tremendous boon those two had brought to humanity. (*See* ANTISEPTICS; DISINFECTION.)

ASPHYXIA, or SUFFOCATION.—General asphyxia is a state produced when air is prevented by any reason from entering the lungs.

The air passages which may be concerned are the nose, the pharynx or back of the mouth, the larynx, the wind-pipe (trachea) and the bronchial tubes. Anything which prevents the free passage of air to and fro in these tubes will cause asphyxia.

The condition may be accidental, as occurs in drowning; when objects such as food, tin whistles, etc., are accidentally drawn into the larynx; or it may be due to disease. The most common cause here is diphtheria, which causes a membrane to grow at the back of the roof of the mouth. This membrane may

extend downwards to the vocal cords where the airway is narrowest, and restrict the passage of air still further till cyanosis or intense blueness occurs, and finally asphyxia. A large goitre or swelling in the neck may press on the windpipe and narrow it; in fact any tumour growing outside the windpipe or bronchial tubes may narrow them and finally cause suffocation.

The condition of necessity is quickly over, since it must either be relieved or the patient dies. At first there is intense blueness of the mucous membranes and skin; marked swelling of all the veins and the eyes stick out. There will be convulsive movements of the limbs and trunk and movements of the chest showing definite difficulty in breathing. If the obstruction is not relieved, these movements become less marked and gradually cease; the congestion of the veins diminishes as the circulation fails, the blueness gives way to a greyish pallor, and life ceases altogether.

Asphyxia lasting for more than about 5–6 minutes will possibly be followed by permanent damage to the brain and may be followed by mental changes.

Accidental asphyxia may arise from the following causes:—

1. Obstruction of the air passages as in drowning, strangulation, choking or swelling of the throat due to the sting of a poisonous insect.
2. Inhalation of poisonous gases or fumes such as household gas or the exhaust of a motor-car.
3. Mechanical pressure such as strangling.

TREATMENT.

Drowning.—Complete and prolonged immersion in water causes death, which is called death by drowning. But always try to resuscitate persons who are rescued, for breathing can often be started again by artificial respiration.

Choking.—The cause is generally a piece of crust or such-like object, that has "gone the wrong way." Or in children it may be a sweet or a marble. Loosen the collar, if any, lean the affected person forward and thump between the shoulders. A child may be held upside down and thumped. If this fails, introduce a finger into the mouth and try to reach the obstruction. This will at least produce a severe retch and cough which may suffice to dislodge the offending object. If these measures are unavailing, send for a doctor without further delay.

Swelling of the throat.—Apply hot fomentations (a piece of flannel or other cloth wrung out of boiling water) to the throat. If the patient is breathing give ice to suck or cold water to drink. Also a few spoonfuls of a vegetable oil if available.

Strangulation.—In a case of hanging, act promptly. Grasp the lower limbs and lift so as to reduce the tension on the rope. If alone do not go for help, but try to cut the rope and get the body down. Then free the neck, loosen any tight clothing and perform artificial respiration.

Suffocation by smoke, gases or fumes.—The would-be rescuer must protect himself by tying a wet handkerchief, folded diagonally, across the bridge of his nose so that it hangs down over his mouth. Crawl swiftly along the floor and drag the affected person out. Once in a safe place loosen the clothing and, if breathing has ceased, perform artificial respiration.

"Blue Asphyxia" in the New-born.—This is characterized by the blue colour and a strongly beating heart. It is usually due to an obstructed air-way, or it may be due to a narcotic drug previously administered to the mother, e.g. chloroform, morphia, etc.

The treatment is first to clear the air passages with a suction pump and then to start artificial respiration. If possible a mixture of carbon dioxide and oxygen should be given. If the lungs are healthy, normal breathing is rapidly established again.

"White Asphyxia" in the New-Born.—Corresponds to the stage described above which occurs when the heart is failing. It is characterized by pallor, muscular weakness and a feeble circulation. It is really a condition of heart failure and the treatment must be gentle. The infant must be kept warm and should be given the carbon dioxide oxygen mixture as above. Failure to respond to this usually denotes severe damage in the brain of the child.

Asphyxia, Local.—A condition where the fingers, toes, ears, and sometimes patches of skin on the arms and legs, become intensely congested and livid, the circulation of blood to the part being almost stopped. The congestion gives rise to swelling, stiffness and pain and later is often followed by loss of feeling in the affected part. This state of

affairs is liable to occur in Raynaud's disease, or when a too tight bandage has been wound round the part.

ASPIRATION.—This term is applied to the act of sucking up or sucking in. It is a method used for withdrawing fluid from a cavity such as the chest, etc. An aspirator is the name given to the apparatus which is used for drawing off fluids by suction.

ASPIRIN.—Acetyl-salicylic acid is more commonly known as aspirin. It is one of our most useful drugs and is used extensively by the public. It is very beneficial in cases of rheumatism in order to relieve pain and promote sweating. One or two taken before going to bed at night often ensure a good night's sleep. It is useful in cases of influenza, headaches and neuralgia. In influenzal complaints, 5 to 15 grains taken at bed-time will often induce perspiration, and fever may be reduced. Children should not be given more than from ½ to 5 grains. Some people cannot take aspirin as it causes palpitation of the heart, and it is inadvisable for people with chronic heart disease to take this drug in large doses. Aspirin should never be taken in large continuous doses as it has a very depressing effect—about 15 grains should be the largest dose taken, the usual tablet containing 5 grains.

ASSES' MILK.—This is sometimes given to infants as it closely resembles human milk, but owing to its deficiency in fat, cream should be added to each feeding-bottle.

ASTHENOPIA.—This means "weak sight" and is described under the heading VISION, ERRORS OF.

ASTHMA.—Asthma is one of the most distressing complaints that a person can suffer from, and it is often almost worse for the onlooker than for the actual patient. It is an affection of the bronchial tubes characterized by spasmodic attacks of breathlessness and coughing, and a feeling of suffocation and tightness in the chest and throat. Although its symptoms are referred to the lungs and bronchial tubes it is really a nerve disease and is one of the small group of allergic diseases. Allergic diseases are diseases which run in families. One member of the family may have asthma, another hay-fever, another urticaria (nettle-rash), and another certain types of eczema, all of which are different manifestations of various forms of allergy, which is a kind of poisoning peculiar to these individuals. For instance, in asthmatic patients certain things which would not affect another person act as irritants to them and bring on an attack of asthma; one man may get asthma at the seaside and another among the mountains; the breathing of grass pollen or the dust of feathers; the eating of shell-fish, fish, strawberries, eggs, milk, aspirin tablets, etc., are all examples of the diversity of things that may cause asthma. It is interesting to note, too, that the proximity of certain domestic animals may cause attacks. The cat and horse are fairly common examples. The late Field-Marshal Lord Roberts was well-known to be a cat asthmatic. Horse-hair mattresses, down pillows and eiderdowns are also frequent unsuspected causes. Some cases of asthma are due to reflex causes, that is, they arise from disorders in distant parts of the body. The most frequent of these causes are to be found in affections of the nose and throat such as nasal polypi, but the condition may also arise from trouble in the stomach, intestines, bladder, kidneys, etc. Eye strain has also been known to cause attacks. Mental influences such as emotion, fatigue, or even the picture of some article which causes asthma such as flowers, a cat, etc., may be sufficient to start an attack.

As has been said previously, asthma runs in families, and men are more often attacked than women. It usually shows itself first in childhood or early manhood. The attacks very often come on in the middle of the night after the patient has been sound asleep and wakes to find himself struggling for breath. He is in great distress and may get up and go to an open window in search of air, an action that has occasionally led to a fatal accident. A bad attack of asthma is always very distressing to the onlookers. The patient's face becomes pale and drawn with an anxious expression. His lips may be blue, his breathing is short and jerky, and he may look as if he were going to die, but, fortunately, he never does. Asthma is not a fatal disease, however troublesome it may be.

Attacks may last for two hours or even longer, and usually finish with a fit of coughing and the bringing up of sputum. The patient will probably be so exhausted that he will drop asleep, and for the next two or three days he may continue to breathe in a wheezy, laboured fashion.

In children the asthmatic attacks may cease for no apparent reason, but the child will still be allergic and must not receive serum treatment for any other disease without first having ascertained how he is likely to react to it.

Treatment.—At the first symptom of the attack an adrenaline, ephedrine or peptone injection under the skin may stop the attack at once. As skilled attention is not usually at hand when an attack begins, it is as well for an asthmatic to find out between times what drugs agree with him and have something always within reach in tablet form, such as tablets of ephedrine sulphate or even aspirins, which in some people give relief. A strong cup of coffee helps some people. Inhaling amyl nitrite, stramonium cigarettes or stramonium burnt in a saucer are other things that may help. (*See also* ALLERGY.)

ASTIGMATISM.—This means "short sight," and is described under the heading, VISION, ERRORS OF.

ASTRAGALUS.—The astragalus, talus, or ankle bone, is the second largest bone of the foot. It rests on top of the heel bone and lies between it and the tibia or leg bone. (*See also* ANKLE.)

ASTRINGENT.—Any drug or substance which produces contraction of the tissues is called an astringent. An astringent is also used to arrest bleeding, diarrhœa, etc. The vegetable astringents owe their effect to the tannic acid, or some similar substances which they contain. They are greatly used for dressings for wounds and burns, and also in the treatment of tonsilitis, pharyngitis, and nasal catarrh. The ointment of galls and opium is a favourite application for piles. Internally, astringents are used to counteract certain poisons such as alkaloids and salts of heavy metals and rendering them temporarily active. They must, however, be removed from the body by means of a stomach pump and purge as quickly as possible. The number of astringents is fairly large, and among the more well-known ones are vinegar or acetic acid, alum, tannic acid, silver nitrate, copper sulphate and adrenalin.

ATAVISM.—This term is applied to a peculiar trait of heredity in which the child is a "throw-back" to a distant ancestor. He does not develop the characteristics of his immediate parents, but of his grandparents or of an ancestor still more remote This inherited characteristic may take the form of a disease such as hæmophilia or gout.

ATAXIA.—Ataxia or ataxy is a nervous condition in which the patient is unable to control his movements. In other words, he is unable to walk without staggering or swaying. Each separate muscle may be in perfect working order and quite efficient, but the patient loses all sense of co-ordination and is therefore unable to produce the necessary action required for walking. In some forms of ataxia there is a hereditary tendency which may occur in several members of a family, and sometimes in several generations of the same family. Friedreich's ataxia is a form which generally appears between the ages of 5 and 15 years, and both sexes are equally affected. The spinal cord may appear smaller than normal, and there may be wasting of certain of the nerves of the body. The disease usually begins very slowly, and the mother may not notice very much beyond a gradual deformity of the child's feet and a definite clumsiness and difficulty in walking, especially in the dark. The eyesight may become poor, and there may be twitching of the muscles of the face and tremors of the tongue. The disease usually gets slowly worse, until the patient eventually is confined to bed. There is no known cure, but in some cases the disease may be stopped and the patient may live for about 30 years after the onset of the condition. The limbs should be carefully massaged, and special walking exercises should be encouraged.

Ataxia is a very common symptom of many nervous diseases which may be quite temporary and unimportant, as in cases of hysteria, etc. The ataxic walk is very characteristic, and although it is often confused with the walk of a drunken man it should not be described as the latter. The patient walks with his legs rather wide apart, and the feet are thrown out in rather an aimless fashion. There is usually difficulty and stumbling in the effort to lift the feet up steps, and when the patient is standing still he places his feet wide apart in order to balance himself better. Much can be done to re-educate and train a patient in the way of using his limbs, but it takes a long time, and patience and perseverance would be required. (*See also* LOCOMOTOR ATAXIA.)

ATHEROMA.—Atheroma is the term applied to hardening of the arteries, due to inflammatory or degenerative changes in their coverings. It is associated with many diseases such as scarlet fever, rheumatic fever, syphilis and tuberculosis. Atheroma, which is a nodular form of arterio-sclerosis, is usually associated with high blood-pressure. (*See also* ARTERIO-SCLEROSIS.)

ATHLETE'S HEART.—A slight incompetency of the aortic valve, one of the large valves of the heart. This is a condition sometimes found in athletes. (*See also* ATHLETICS.)

ATOMIZER.—An atomizer is an instrument for transforming a liquid into a fine spray and for projecting the spray as required. It may be worked by a rubber bulb, or, for more specialized use, it can be obtained with a small electric motor. The usual apparatus has two nozzles, one for the nose and the other for the throat. A simple nasal oil, made up of menthol and liquid paraffin will give relief in cases of nose or throat irritation. When spraying the throat the atomizer should be placed as far back in the mouth as possible, and deep breaths should be taken while the oil is being pumped. The same method applies to the nose. Throat and nose spraying will be found most beneficial at the beginning of a cold in the head.

ATROPHY.—When there is a wasting of the tissues of the body or when the tissues diminish in bulk, this process is termed atrophy. It is inevitable in old age, where the reparative capacity of the tissues is greatly diminished, and general atrophy or wasting takes place. Muscular atrophy may set in by the inability of a patient to move his limbs for himself. This may be lessened by massage or stimulation by electricity.

General wasting often occurs in children who are being starved from insufficient or improper feeding. Rickets, syphilis and tuberculosis, as well as many other serious diseases, generally give rise to wasting, especially in young children. (*See also* MARASMUS.)

ATROPHY (SENILE) OF THE SKIN.—The skin, like all other parts of the body, undergoes changes as we pass from middle to old age. It not only receives less nourishment, but can deal with less. Its glands become inactive, and the skin itself becomes dry, thin and "poor." Its elasticity also goes and with it the power of accommodating itself to the size and shape of the parts underneath, so that it becomes loose and wrinkled.

Senile atrophy of the skin, therefore, is a natural change rather than a disease in most cases. Occasionally, however, it can be very troublesome. The skin may become thin, with discoloured spots and patches which may become greasy, crusted or scaly, and thickened. Flat warts may develop on these patches and these may become cancerous. In a great many old people, however, the real complaint is itching of the skin called pruritus. This may be limited to certain parts—commonly the anal region and the middle of the back—or may be more or less all over the body. It is not usually very severe, but is a constant annoyance. Many people complain that it is most troublesome for the first half-hour or so after going to bed.

The general health must be carefully regulated, since the better this is, the better the skin condition will be. If the itching occurs, the doctor should make a thorough examination to be sure that no general disease is present. A mild form of diabetes or Bright's disease may show itself in this way, or various other diseases, which would probably be missed if the skin were acting healthily. Anal itching is frequently associated with hæmorrhoids (piles), which again may give rise to no trouble in themselves. Grease in some form is the best treatment; it not only relieves the itching, but counteracts the dryness and scurfiness of the skin. If the patient can digest fats readily, he should take plenty in the diet in addition, to increase the fat layer under the skin. Itching is often worse in very thin old people than in the well-covered. Externally, almond oil, cold cream and vaseline are all good; but it should be remembered that the skin has its likes and dislikes for grease in different forms. If one form of grease does not suit it the patient should be encouraged to try another till he discovers one that does suit him. A hot bath at night is often very helpful, followed by the ointment. For use in the daytime, a lotion is more convenient.

Medicated baths, and many varieties of lotions and ointments, are also in use. The itching is often alleviated by the wearing of cotton or silk next the skin, in preference to wool.

ATROPINE.— A drug obtained from the plant, Atropa belladonna, more commonly

known as the deadly nightshade. A great amount of atropine is obtained from Egyptian henbane. The actions of belladonna and atropine on the body are the same. If atropine is placed by itself upon the unbroken skin it does not become absorbed; but if it is placed with substances which are absorbed, such as alcohol, glycerine, or camphor, or applied to a broken surface, it produces local anæsthesia.

Given internally or by hypodermic injection, atropine lessens the perspiration and stops the flow of saliva in the mouth. It is often injected to relieve bronchial spasm, whooping cough and asthma, and also in cases of sciatica and cystitis. Atropine acts on the nerve endings in the muscles of the eye. If it is dropped into the eye, or given by mouth, the pupil of the eye dilates to a very marked degree; this fact is made use of when examining the eyes. Belladonna is one of the favourite remedies for bed-wetting, as children do not suffer from any ill-effects from this drug. Injections of atropine given at bedtime will often check the excessive sweatings which occur in diseases such as tuberculosis, etc. This drug has also been tried hypodermically as a cure for seasickness and an injection on embarking has proved efficacious as a preventive.

Poisoning by Atropine.—Poisoning often occurs as the result of eating the leaves of the deadly nightshade plant or through having an overdose of the drug. The mouth and throat will become dry and difficulty will be experienced in swallowing; the pulse may be a little slow. The pupil will be dilated and the vision may become confused; the skin will feel very dry. If the dose has been a large one, the symptoms will appear quickly and the pulse rate may increase rapidly after the slight decrease. The patient may become giddy and stagger when he walks, and a rash may appear on the skin. Later, the patient may become delirious and death may take place from failure of the breathing. Treatment consists of emetics or washing out the stomach. Artificial respiration should be employed if necessary and the patient should be kept warm with hot-water bottles. Strong coffee may be given later.

AUDITORY or ACOUSTIC NERVE.—Is the eighth cranial nerve and is the nerve of hearing. It comes out from underneath the brain and goes through a little opening in the skull to the internal ear. This analyses the sounds brought to it by the external ear and sends on the messages to the brain by the auditory nerve.

AURA.—This word literally means a breath, and it is applied to the slight warning symptoms which go before an attack of epilepsy. The "aura" may appear in various ways. Sometimes the patient is warned by a peculiar taste in the mouth, or an itching on some part of the body, or the warning may be a mental one. Such an aura may be of very real benefit in enabling a patient to take precautions to ward off an attack. An electric aura is the term applied to an electric breeze. (*See also* EPILEPSY.)

AURICLE.—This name is applied to the expanded portion or pinna of the ear. It is also the term given to two very important parts of the heart which are rather ear-like in shape. One is the upper chamber of the heart which receives the arterial blood from the lungs and is called the left auricle, and the chamber which receives the venous blood from the general circulation is the right auricle.

AURIST.—The word aural means relating to the ear or to hearing, and an aurist is a person who specializes in diseases of the ear. An aurist is usually a surgeon who deals with affections of the nose and throat as well as the ear.

AUSCULTATION.—This is a method of finding out the conditions and functions of various organs of the body by the sounds they themselves give out. Much can be learned about the heart by listening to its beat and the same applies to the lungs and other organs. In the old days auscultation used to be practised by placing the ear directly over the organ; this is known as immediate auscultation and is sometimes used in the case of children. The stethoscope is now largely used and it is able to furnish more definite conclusions for diagnosis.

Another advantage of the stethoscope is that it enables the doctor to study the sounds proceeding from very small areas, much more so than under the method of immediate application of the ear. Apart from the sounds which the heart valves make when opening and closing, there are other sounds which are described as murmers or bruits. There are many varieties of murmurs and they each have their own place and meaning.

The presence of these murmurs does not indicate any disease of the heart unless certain changes take place in their character. Long practice enables the doctor to distinguish between the normal and abnormal sounds.

AUTOGENOUS VACCINE.—An autogenous vaccine is one made from the patient's own germs. Stock vaccines are usually made from germs grown in the laboratory. (*See also* GERMS; VACCINES.)

AUTO-INTOXICATION.—By auto-intoxication is meant the poisoning of the body by products which, owing to faulty working of the various organs, are manufactured within the body. It is therefore self-poisoning by the body's own products. This poisoning of the system may occur in three ways: It may be due in the first place to discharges from the tissues which should be neutralized or modified by other discharges, and which through faulty production of these other discharges are not so modified and therefore act as poisons. The auto-intoxication may also be due to the decomposition of tissue or to germs. This form of toxæmia is known as *endogenous*. In the *exogenous* form the poisons enter the body from without, through the skin, digestive or respiratory system or the genito-urinary tract and give rise to decomposition and fermentation products. In the third place auto-intoxication may be caused indirectly by the absorption of retained matters which should have been excreted, such as fæces.

There has been a great deal of discussion latterly about auto-intoxication, and some people are inclined to maintain that it is a definite disease which is more or less hereditary. This cannot be proved, and it is much more likely that the condition is due to the causes given above and can be treated best by correcting the underlying fault in the machinery of the body, whilst doing everything possible to free the patient from the poisons in his system.

The symptoms of auto-intoxication are very varied and the condition may lead to prolonged ill-health. There may be headache, giddiness, flatulence and dyspepsia, anæmia, muscular pains, skin troubles, physical and mental deterioration, nervousness and depression.

AUTOMATISM.—This is the term applied to that state in which persons go through various actions without the mind controlling them. Automatic actions occur in some hysterical patients or in cases of epilepsy, and also in certain mental conditions. Somnambulism or sleep-walking may be regarded as a form of automatism.

AUTOPHOBIA.—A morbid dread of being by one's self or of solitude.

AUTOPHONY.—The condition in which one's own voice appears changed. It may be due to chronic inflammation of the ear or to other causes.

AUTOPLASTY.—The method of repairing the effects of a wound or lesion where there has been loss of flesh by grafting or implanting fresh parts taken from other portions of the patient's body.

AUTOPSY.—The post-mortem examination or examination of a body after death. (*See also* POST-MORTEM.)

AUTO-SUGGESTION.—Means to suggest to one's self, and as a method of treatment in illness which exists only in the patient's imagination, it is of great value. If an examination by a competent doctor has shown no signs of real disease, either mental or physical, then a patient may with profit be advised to turn his thoughts from the idea of disease, to break himself of the habit of thinking he is ill, and to create the habit of thinking he is well. But to employ such a method of "Cure" in the case of *real* disease, however obscure the cause may be, is but to invite failure; though, as an aid to more adequate treatment, it is certainly of great help if the patient himself is hopefully expectant of cure. Auto-suggestion has received much attention recently from the propaganda work of Coué, a French physician who sought to influence health not by willing one's self to be well, but through the subconscious mind, which is supposed to respond to constantly and mechanically repeated phrases such as "I'm getting better every day."

Auto-suggestion has proved of a certain value, when used in the way Coué recommended, in sleeplessness, where the cause is mental anxiety or stress. The patient repeats, quite mechanically, the words "I'm going to sleep," in a soft monotonous whisper, until he falls asleep. After a few nights it becomes a habit to repeat this phrase and often sleeplessness can be completely cured by this means.

BABINSKI'S REFLEX is the name given to a simply performed test to discover the state of the nerves. The foot is bared and a sharp object—like the point of a pin—is drawn along the sole of the foot. In a normal state of the nerves the toes would bend down towards the sole, but in certain nervous states the big toe bends upwards and the other toes spread themselves in fan-shaped fashion. This action of the toes is natural in very young babies, but in older people denotes a nervous disturbance.

BABY.—There are many things in the care and feeding of a baby which it is absolutely necessary for the young mother to know, and in the SUPPLEMENT ON BABY found at the end of this book, the subject has been dealt with very fully. Nowadays more than ever, the importance of proper diet and cleanliness is realized, and is known to lead to healthy and intelligent children, and every wise mother should endeavour to give her child a good start in life in the one thing that really counts—and that is good health.

BACILLURIA.—The presence of any kind of bacillus or germ in the urine is called bacilluria. The germ may get into the urine through the blood, from which it passes to the kidney and then to the bladder. All the common germs such as the colon bacillus, the typhoid bacillus, the streptococcus, staphylococcus, etc., may be found.

Bacilluria may follow a serious disease such as typhoid fever or pneumonia, or after a long-drawn-out condition such as gonorrhœa. In some cases there may be pain over the bladder, and frequent and painful passing of water. In other cases there may be no special symptoms except a slight increase in the frequency of passing of water. The urine may have a shiny look which is characteristic of the condition, or on the other hand, its appearance may be normal. The condition is met with in both children and adults, but is rather more common in women than in men. In children bed-wetting may result, and unless the urine is examined for germs the condition which is causing the bed-wetting may be overlooked. In women, both before and after childbirth, the condition is sometimes found.

Treatment.—The patient should be put to bed and the bowels should be kept open by giving a dose of castor oil, up to two tablespoonfuls for an adult, one for a child, followed the next morning by salts or "white mixture" in water. Afterwards the bowels may be kept open daily with cascara or an enema. The patient should have plenty of fluid, about 6 to 8 pints a day, but not too much milk. Mineral waters and barley water may be given freely. The urine should be kept alkaline by giving doses of bicarbonate of soda liberally every four hours. Such is the treatment in an acute bacilluria, but in a chronic infection the urine tends to become alkaline and every effort is made to get the urine acid. The latest treatment in chronic urinary infections is to give a **Ketogenic diet,** i.e. a diet that tends to form "ketones" in the urine. This is done by giving as much fat as possible with little carbohydrate or protein—creams, fats, olive oil, butter, etc. To obtain as great concentration of ketones as possible, little fluid is taken. (*See also* GERMS.)

BACILLUS.—Certain types of germs or microbes which are shaped like little rods, are termed bacilli, which is the plural for bacillus. A great number of diseases owe their origin to bacilli in some form or another. For instance, tuberculosis, meningitis, anthrax, diphtheria, typhoid fever, dysentery, and very many more diseases, are all caused by bacilli. The cultivation of certain bacilli plays a very important part in the processes of wine making; they are also responsible for the rotting which takes place in dead animal matter. (*See also* GERMS.)

BACK.—The back consists of the spinal column or backbone with the back parts of the ribs and of the haunch bones and sacrum, with the muscular tissue which binds these bones together. The muscles of the back are very strong and powerful and have to support the head, as well as move the upper and lower limbs. The *trapezius* is a large triangular sheet of muscle connecting the arm with the spinal column. It stretches from the back of the neck to the middle of the back. The *latissimus dorsi* is the corresponding triangular sheet of muscle in the lower back, attaching to the lower limbs. The *levator anguli scapulæ* is a band of muscle proceeding from the neck to the shoulder which helps to raise the arm. The *rhomboideus major* and *rhomboideus minor* assist in the act of breathing and turning the

back from side to side. These are the most important muscles of the back, but there are many more. A well-developed muscular back can be bent almost to the floor backwards and forwards and sidewards, but because of its great supply of muscular tissue it is very frequently the seat of muscular rheumatism, and is apt to become stiff. Strains and twists are of frequent occurrence also. Diseases and injuries of the spinal column are usually of a serious nature. A theory is held by people who call themselves *chiropractors* that most disease is due to pressure on the nerves of the spinal column owing to displacements of the *vertebræ* or small bones of the spinal column. There is, however, no truth in the theory, as the openings between the vertebræ are very large and pressure could only take place if there were some very noticeable deformity of the spine. (*See also* BACKBONE.)

BACK-ACHE.—Many people have an aching pain in the back without being able to state any reason for it. Pain, stiffness or tenderness in the back is a symptom to be met with in a number of different diseases. An early symptom of smallpox is severe aching in the back, and there is always a certain amount of back-ache in fevers. In meningitis, or brain-fever, any pressure along the whole spine usually causes pain and tenderness; this is often accompanied by great stiffness at the back of the neck. In rheumatism, chronic or acute, there may be much pain and stiffness. Pain in the back about the level of the waist is very often due to spinal disease, or it may be due to kidney trouble. Lumbago is a very common form of back-ache which is always made worse by stooping.

In women, pain in the back is so common that women have been divided into two classes, "those with backs and those without them." In some cases the pain may be due to a disorder of the reproductive organs. In such cases the pain is usually felt low down in the back and relief may sometimes be had from surgical operation. There are, however, many women who suffer from pain in the small of the back without any sign of disease and who are otherwise perfectly well. It is usually worse when the woman is tired, and before and during the courses. Rest, especially lying down, is the only way of relieving the pain but it does not cure it. This form of back-ache is very often due to weakness of the muscles of the back which in turn is probably due to insufficient exercise. In these modern days, a more sensible view is being taken with regard to the bringing up of young girls and there is no doubt that their health will improve as a result. In the days when women wore extremely tight corsets and clothes which hung from the waist instead of from the shoulders, it was not to be wondered at that swooning and back-ache were "fashionable." Young growing girls should be made to take a reasonable amount of exercise as well as a sufficient amount of rest, and anything in the nature of tight-lacing should be avoided.

Muscular overstrain, constipation, neuralgia, hysteria and anæmia are among a few other causes of back-ache, and in order to treat this complaint, the patient would be advised to undergo a medical examination to find out the real cause of the pain.

BACKBONE.—The backbone is the popular name for the spinal column or vertebral column, the strong supporting column of bone which stretches from the head to the bottom of the back and has the shoulder bones, the ribs and the haunch bones attached to it. In the normal adult who is standing erect, the spinal column curves slightly in four parts. Beginning at the head it curves slightly out, then in a sweeping curve inwards under the shoulders, out over the haunches and in at the end of the spine. Other curves are frequently developed by habitually standing in a bad position when the backbone is in an easily bent state owing to youth or illness. These abnormal curvatures are called *lordosis*, *kyphosis* and *scoliosis*. The spinal column is composed of thirty-three small bones, called *vertebræ*, which are joined together by cartilage and ligaments. Each vertebra has a hole through it, through which the spinal cord runs for the whole length of the spine. The thirty-three vertebræ are divided into groups of cervical, thoracic, lumbar, sacral and coccygeal vertebræ. From the head downwards there are seven cervical vertebræ, twelve thoracic, five lumbar, five sacral and four coccygeal vertebræ. The cervical, thoracic and lumbar vertebræ are separate bones, but the sacral and coccygeal vertebræ are joined together to form bones called the sacrum and the coccyx

The spaces between the vertebræ are filled with elastic tissue which acts as a buffer from shock, so that a severe blow on either end of the spine such as would be caused by sitting down suddenly on something hard or being hit violently on the top of the head, does not fracture the spine, as it certainly would if the spine were composed of solid bone. The spinal cord inside the backbone is very strongly protected from injury, and dislocations of vertebræ are very rare. Fracture of the backbone only occurs as the result of great violence, such as being run over by a heavy vehicle, or crushed under a heavy load. If a fracture does occur, however, it is a very serious matter, because of the damage which will most likely be done at the time of the accident to the spinal cord, which may lead to paralysis and death. The backbone is liable to be attacked by tuberculosis and other bone diseases, and also by abnormal curvatures. (*See also* SPINAL CURVATURE.)

BACTERIA.—The modern medical name for germs. Other names for germs are microbes or micro-organisms. These will be described under the heading GERMS.

BACTERIOPHAGE. — Anything which destroys bacteria and prevents them from growing is called a bacteriophage.

BAEL FRUIT.—Obtained from the bael tree which grows in India, the fresh, half-ripe fruit is used as a drying-up agent. The fresh fruit is used in the treatment of dysentery and dyspepsia.

BAGDAD BOIL.—*See* ALEPPO BUTTON.

BAKEHOUSES WELFARE ORDER.—By a law passed in 1927 it is required that all persons employed in a bakehouse should have a suitable place provided for washing themselves, and also a suitable place in which to keep the clothing which they are not wearing during working hours. Absolute cleanliness on the part of the workers is insisted upon and a strict watch must be kept on the state of their skin to see that it remains healthy. *Baker's itch* is a kind of eczema which breaks out in the form of small blisters which afterwards burst and discharge a clear, watery fluid or "weep" as it is called. This form of itch is caused by germs which enter through cracks in the skin and set up ulceration. The disease, when it has once been acquired, is very hard to get rid of, and workers, especially those who mix by hand, may have to remain away from work for as long as six or nine months. (*See also* DERMATITIS.)

BALANITIS.—This is the name given to inflammation of the head of the penis, or organ of reproduction in the male. Lack of cleanliness is often the cause of the complaint. The foreskin should be drawn back and the part washed carefully. In some cases it might be better if the operation of circumcision or cutting short of a too long foreskin, were performed, thus allowing the part to be kept clean more easily.

BALDNESS.—The question of the relation between the general health and baldness is a much discussed one, but there can be no doubt that there is a close relationship between the two. The loss of hair in old age shows that this is so. Loss of colour and thinning of the individual hairs almost always start about the age of forty, when the health and physical strength are about to begin their journey on the downward path to old age. Premature or early baldness is generally the result of a diseased state of the scalp. Dandruff and greasiness are signals to be looked out for and promptly treated when they appear, if baldness is to be avoided. In dry seborrhœa (scurf), a disease which is described later, dandruff is usually present in excessive quantities and is flaky in character; while, in the greasy form of the disease, the dandruff sticks closely to the scalp and makes the hair appear limp and moist.

Scurf usually makes its appearance long before it becomes troublesome enough to attract attention. It attacks the scalp gradually and may go on for years. The condition is caused by a germ which is infectious, and is usually spread by hairbrushes, combs, hats, towels, etc.

Premature baldness is much more common in men than in women. In men, thinning of the hair generally begins on the crown of the head, but in some cases the hair recedes from the temples, leaving the crown of the head well covered.

Temporary loss of hair often occurs owing to certain diseases, and a change of climate, especially if it is to a warm one, will sometimes account for this condition. During the summer months many people find that their hair becomes noticeably thinner. This is of course a natural process, the same as

the moulting of the coats of animals in summer, when the winter coat would be too warm.

Complete baldness.—In cases of typhoid fever and scarlet fever or severe measles, people have been known to become completely bald, and in some wasting diseases, such as tuberculosis, the hair also falls out. In any form of illness it is usual to find the hair losing its glossiness and becoming thin and easily broken. Among the simpler complaints which account for this, constipation is the most common. It is generally the rule that the hair will return to its normal state once the blood has been freed of the poisons which have been causing the temporary illness.

Treatment.—To increase the growth of the hair the general health must be carefully attended to. Once the body is in perfect health, the hair will naturally improve in glossiness and growth. To treat a diseased condition of the scalp, absolute cleanliness is the first and most important step. Many forms of "hair drill" can be procured, but whichever remedy is used, months of energetic treatment will have to be carried out. Dandruff, which is more common in the British Isles than in any other part of the world, and might almost be called a national disease, is a condition which may take a long time to get rid of and in which patience and perseverance play a large part if it is ever to be overcome. The head should be washed with a pure soap, such as the ordinary liquid green soap which is obtainable in bottles quite cheaply from any chemist. It should be rinsed thoroughly with repeated fresh waters. This should be done every other day in the case of a man or short-haired woman, and at least twice a week even if the hair is long and difficult to wash and dry. After washing, rub in and repeat daily, an ointment made up of 25 grains of salicylic acid to 1 ounce of vaseline. This ointment should be rubbed into the scalp for about ten minutes, not merely plastered on the scalp. It should be remembered that by vigorously rubbing the scalp the blood supply is brought to the surface and this acts as an important part of the cure. Stimulating the scalp by the use of electricity is also very helpful, and most hairdressers have the apparatus for carrying out this treatment, but it is rather expensive. Treatment by mercury vapour lamps has had some wonderful results in baldness, in fact it has been claimed that it makes hair grow in almost every case where the treatment is carried out. These special treatments may be worth the expense in cases where baldness makes a person look so much older than his years that he finds himself being passed over for jobs in favour of men whose hair is younger than his, although they themselves are not.

Baldness which occurs in patches is medically termed *alopecia areata*, and will be found under its own heading.

Baldness may be due to an abnormal state of the roots of the hair which is present from birth, and is usually found in other members of the same family. Nothing much can be done for them and they usually have to wear wigs.

BALNEOLOGY. — Balneology is the science of the treatment of disease by baths of various sorts, and by mineral waters. There are many forms of treatment of this sort which will be described fully in the article on BATHS. Baths and mineral waters are particularly useful in the treatment of rheumatism, and arrangements are now being made, especially by the Red Cross Society and the National Insurance Commissioners, to bring these treatments within the reach of everyone, however small their means may be. (*See also* BATHS AND BATHING.)

BALSAM.—Balsams are oily, pleasant-smelling substances which are obtained from the stems of certain trees and plants. Sometimes they flow out of the plant naturally, but usually they have to be obtained by making a slit in the stem or leaves of the plant and collecting the juice which oozes out. A balsam, generally speaking, is a mixture of oils, resins, and acids.

Friars' Balsam, which was discovered by the friars many hundreds of years ago, is the balsam which is best known. Its medical name is compound tincture of benzoin. Benzoin or Gum Benjamin is a resin obtained from a plant which grows in tropical countries, and to make Friars' Balsam it is mixed with other ingredients. It is almost a cure-all, being used as a dressing for wounds and sores of all sorts, and as an antiseptic. It is used in the making of sticking plaster. As well as these uses it is very popular in cases of bronchitis and sore throat, or severe

cold in the head. It may be swallowed in doses of a teaspoonful to loosen a cough and help to bring up expectoration, but more often it is used as an inhalant. One or two teaspoonfuls are put in a pint jug of hot water and the patient puts a towel over his head and the jug and breathes in the steam. If this is done every two or three hours, stuffy heads and sore throats and chests will be made much more comfortable.

Balsam of Peru comes from the bark of a tree which grows in South America. It is used as a disinfectant in skin diseases such as itch or ring-worm. It is also sometimes used in cough mixtures.

Balsam of Tolu is chiefly used as a syrup in cough mixtures for children.

Storax and **Copaiba** are two other balsams which are in general use. Storax has the same effect as balsams of Tolu and Peru and benzoin, and may be used for the same purposes, but is only given internally as one of the ingredients in Friars' Balsam. It may be mixed with an equal amount of olive oil and rubbed into the scalp to destroy nits and lice. Copaiba is another South American balsam. Its use is as a disinfectant in cases of diseases of the bladder, kidneys, or in gonorrhœa. It gives the breath a very disagreeable odour, however, and so is not often used except in gonorrhœa.

BANDAGES AND BANDAGING.—There are two chief varieties of bandage, the *triangular* and the *roller*. They are generally made of calico, bleached or unbleached, or of white cotton sheeting. Linen is an excellent material for the purpose, but too costly.

In first-aid work the triangular bandage is far the more commonly used. It is made by cutting diagonally across a piece of material from 36 to 42 inches square. Two triangular bandages are thus formed, measuring 36 to 42 inches along the sides and 50 to 60 inches along the base.

The parts of a triangular bandage are the point or apex, the base, the two sides and the two ends.

A **Broad-fold** bandage is made from a triangular bandage by bringing the point to the centre of the base and folding again.

A **Narrow-fold** bandage is made from a broad-fold bandage by folding once more.

There are two methods of folding a bandage for packing: (*a*) Make a narrow-fold bandage and bring the two ends together to the centre. Do the same again and then double the bandage upon itself to form a compact oblong. The bandage can be rapidly undone and is ready folded for use. (*b*) Another method: Spread out the bandage on a flat surface. Fold one end over to lie on the other, thus forming a triangle half the size of the original. The centre of the original base is now the apex and the original apex is one of the new ends. Fold the original apex over to the new apex and also the new ends, thus forming a square. Fold this over to form an oblong and once again to make a small square.

Always tie the ends of a triangular bandage with a reef knot. A granny knot is not safe and should never be used.

Place the knot so that it does not press into or chafe the patient. If it is likely to be uncomfortable, place a pad between it and the patient's skin. When a knot is completed the ends should be tucked out of sight. If tying a knot is not practicable, large safety-pins are used to secure the ends of the bandage.

Triangular Bandages

(*a*) **Large Arm Sling.**—This is used to support the forearm. Pass one end of the bandage over the shoulder on the normal side and round the back of the neck. Bring it down nearly to the level of the breast on the injured side. Slip the apex of the bandage across the front of the body and behind the elbow of the injured arm. Bend the elbow and lay the forearm over the middle of the bandage. Bring up the lower end and tie just below the collar-bone. Now bring forward the apex from behind the elbow and fix with two safety-pins.

Note.—It is advisable to adjust the large arm sling so that the finger-nails of the supported hand are just visible beyond the edge of the sling. From their appearance the state of the circulation in the injured limb can be judged. If the nails show a bluish tinge, denoting constricted circulation, the position of the hand may need to be changed or the sling dispensed with to free the circulation.

(*b*) **Narrow Arm Sling.**—This bandage supports the wrist, leaving the elbow free. It is used for (*a*) a fracture of the upper arm, and (*b*) minor injuries to the hand or shoulder.

Pass a broad-fold bandage over the sound shoulder, behind the neck and down nearly

to breast-level on the injured side. Bend the elbow so that the forearm is at right angles to the upper arm. Place the wrist over the



Triangular Bandaging:
First Stage of Sling for Fractured Forearm

middle of the bandage so that half the little finger extends beyond the edge of the bandage. Carry the second end up to the first and tie just below the collar-bone on the injured side.

(*c*) **St. John's Sling.**—This bandage supports the arm and keeps it close to the side. For an injury on the *right* side proceed as follows. If the injury is on the *left* side, substitute "left" for "right" and vice versa.

1. Fold the patient's right forearm flat across his chest, fingers pointing to his left shoulder.

2. Take an unfolded triangular bandage with its apex in your left hand and one end in your right. Lay it over the patient's forearm, the end on his left shoulder, the apex well beyond his right elbow.

3. Tuck the base of the bandage well in under the hand and forearm, supporting the elbow meanwhile. Bring the lower end across the patient's back, up over the left shoulder to the front and tie the ends.

4. Hold away the side of the bandage lying on the forearm and tuck the apex well in between the forearm and the side you hold. This produces a fold which you bring round behind the arm and pin securely to the bandage where it runs up the back.

There are many simple ways of improvising a sling. Take two handkerchiefs. Tie one loosely round the neck. With the other make a sling, the ends being tied in the loop formed by the first handkerchief. This will give a sling of the necessary length. Or simply support the hand well inside the buttoned coat. This is more effective if the sleeve be pinned to the coat as well. A third method is to turn up the lower edge of the coat and pin it near the lapel.

Bandage for the Hand.—Spread out a triangular bandage on a flat surface and fold a hem along its base. Place the open hand on the bandage, palm downwards, the wrist on the hem. Fold back the apex over the back of the hand and wrist. Cross over the ends and pass them round and round the wrist, finally tying them over the back of the wrist.



Triangular Bandaging:
Final Stage of Sling for Fractured Forearm

Now fold back the apex over the knot towards the fingers and pin it.

Bandage for the Wrist.—Place the hand palm downwards over the centre of a narrow-fold bandage. Pick up the ends and bring them round the hand, leaving the thumb clear. Cross them over the back of the hand

and round and round the wrist and lower forearm. Tie off on the back of the forearm.

Bandages on the Elbow.—Fold a 3-inch hem along the base of a bandage. Bend the injured elbow and lay the middle of the hem on the back of the forearm folded side inwards and the point of the bandage reaching up the back of the upper arm. Cross the ends in front of the elbow then round and round the back of the arm above the elbow. Tie them behind, turn down the point to hide the knot, and pin it to the bandage.

Bandage for the Shoulder.—To keep a dressing on top of the shoulder. Two bandages are needed. Fold a 3-inch hem along the base of the first bandage. Place its centre-hem inwards, against the upper arm, the apex running up the side of the neck to the ea·



Triangular Bandaging: Hand Bandage, Half Finished

Pass the ends round and round the arm and tie. With the other bandage apply a narrow arm sling with the knot on top of the apex of the first bandage. Draw up the apex and fold it down neatly over the knot and pin securely to keep the whole thing in place.

Bandage for the whole Foot.—To keep a dressing on the foot. Fold a 2-inch hem along the base of a triangular bandage. Place the



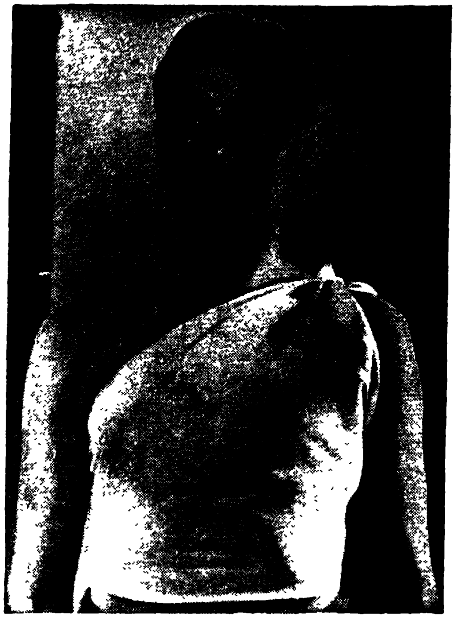
Triangular Bandaging: Hand Bandage, Final Stage

foot in the centre of the bandage, the toes pointing to the apex. Fold back the apex over the toes and instep and leave it pointing up the front of the ankle. Gather up the ends so that the heel is covered and cross them over the instep. Take them round behind the ankle, cross them and bring them forward again. Tie them in front. (If the bandage is too long, pass the ends once round the sole of the foot before tying off.) Draw up the apex, fold it over and pin it to the bandage above the instep.

Bandage for the Ankle.—When treating an injured ankle place the centre of a narrow-fold bandage against the sole of the foot. Bring up the ends and cross them over the top of the foot. Pass them round behind the ankle, cross them and bring them forward. Cross them again and down round the sole of the foot. Continue until the ends are short and tie them off where convenient.

Bandage for the Knee.—Fold a 2-inch hem along the base of the bandage. Place the apex in front of the middle of the thigh and the centre of the base just below the knee-cap. Cross the ends behind the knee. Then bring them round to the front and tie above the knee. Pull up the apex to smooth out the bandage. Fold it over the knot and pin.

Bandage for the Hip.—To keep a dressing in position on the hip, two bandages are needed. With the first make a narrow-fold bandage and tie it round the patient just below the rim of the haunch-bone (pelvis), with the knot on the outer side of the affected hip. Lay the second bandage on the hip and pass the apex under the knot of the first bandage. Draw it up for about 4 inches. Fold the base of the second bandage inwards in a 2-inch hem and pass the ends horizontally in and round the thigh, and round and out again. Tie them on the outside. Pull up the apex to smooth out the bandage. Turn it down over the knot and pin in position.



Triangular Bandaging: Bandaging of Chest—Front View

Bandage for the front of the Chest and Abdomen. — Spread an open triangular bandage over the chest and abdomen, the base lying across the chest and the apex pointing down. Pass the ends under the armpits, behind the body and tie. Spread a second bandage similarly, but with the base lying across the lower abdomen and the apex pointing to the chin. Tuck the apex in under the first bandage and pin it there. Pass the ends round the patient and tie behind. Turn up the apex of the first bandage and pin it. *N.B.*—The foregoing is an emergency bandage to be replaced later by the orthodox "many tailed" bandage.

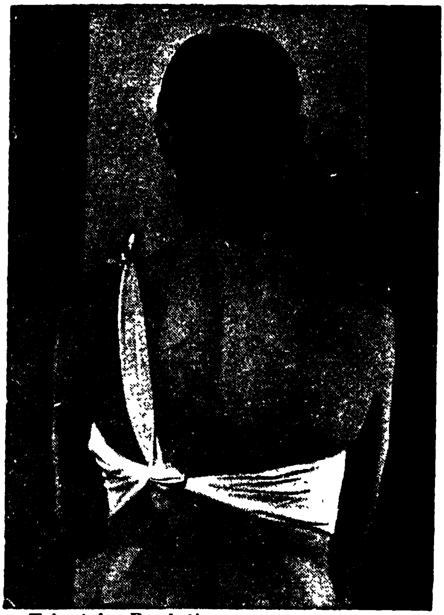


Triangular Bandaging: Bandaging Foot

Bandage for the Chest.—Used to keep a dressing on the chest. Stand in front of the patient and place an open triangular bandage on his chest. Push the apex well over the shoulder on the dressed side. Fold the base over inwards in a 3-inch hem. Bring the ends round behind the back and tie them vertically below the apex. One end will be longer than the other. Carry it up and tie to the apex on top of the shoulder.

Bandage for the Back.—This is applied in the same way as the bandage for the chest, except that the patient stands with his back, not his front, towards the dresser.

Bandage for the Scalp.—Used to keep a dressing on top of the head. Lay an open triangular bandage on top of the patient's head, so that the apex hangs down over the nape of the neck. Fold a hem about 2 inches wide in the base, so that it lies above the eyebrows. Go behind the patient and draw back the



Triangular Bandaging: Bandaging of Chest—Back View

ends, so that they pass just above the ears. Cross them over and pass them to the front again. Tie neatly in the centre of the forehead. Gently pull down the apex until the bandage is smooth, then turn it up and pin on top of the head.

Bandage for the Eye.—Place the centre of a narrow-fold bandage over the dressing on the eye. Carry one end round below the ear on the injured side and the other end over the top of the head on the uninjured side. Cross the ends at the back of the head, bring them forward again and tie off over the injured eye.



Elastic Bandage for Ankle

Roller Bandages

Roller bandages are strips of material rolled into firm cylinders for easy application. They are usually some yards in length and of various widths suitable for different parts of the body.

Bandages ¾–1-inch wide are used for fingers and toes, 2½-inch for the head and arms, 3-inch for the legs, and 4-inch for the trunk.

When a roller bandage is ready for use, the roll is called the "head" and the loose end the "tail."

These bandages may be rolled by hand, but can be more quickly and efficiently rolled by machine.

When rolled up, the free end should always be secured by a safety-pin, this ensures a pin being to hand to fasten the bandage when needed.

The principal uses of a Roller Bandage are:

1. To retain dressings or splints in position.
2. To support a sprained or dislocated joint, when the patient begins to use it again, and to prevent swelling.
3. To treat or prevent varicose veins.
4. To drive the blood to a different part of the body, as is done by bandaging limbs in extreme collapse from hæmorrhage.
5. To prevent hæmorrhage after operations.

Rules for applying Roller Bandages:

1. Apply the outer surface to the skin.
2. Bandage from below upwards, and from within outwards.
3. Bandage the chest from below upwards; but the abdomen from above downwards.
4. When bandaging to retain a dressing or splint, leave the tips of fingers or toes exposed. The colour of the nails indicates the state of the circulation of the blood in the limb. If congested, numb, or swollen the bandage is too tight, and

the splint or dressings need to be re-adjusted.

5. Each fresh layer of the bandage should cover two-thirds of the preceding layer.
6. Fix the finished bandage securely.
7. Whenever possible place a layer of wool under the bandage. This permits the bandage to be drawn tighter, without constricting the veins.
8. Use a bandage of appropriate size.

Methods of applying Bandages.—The four principal methods of applying roller bandages are:

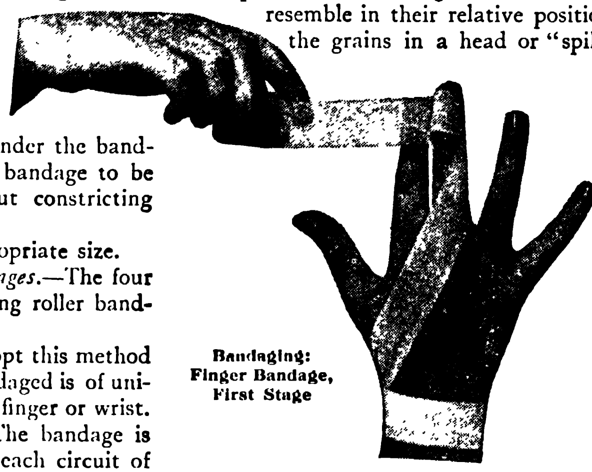
1. The Simple Spiral. Adopt this method when the part to be bandaged is of uniform thickness, e.g. the finger or wrist.
2. The Reverse Spiral. The bandage is twisted upon itself at each circuit of the injured part. Adopt this method for parts of varying thickness, e.g. the forearm or leg.



Bandaging: Finger Bandage, Final Stage

The Figure of Eight. This is used for a joint or its vicinity. It is made by passing the bandage obliquely round the limb upwards and downwards, so that the loops look like the figure 8.

The Spica. This is a modified figure of 8, and is so called because when completed, the crossings of the bandage resemble in their relative positions, the grains in a head or "spike"



Bandaging: Finger Bandage, First Stage

of barley. It is described in detail under the appropriate headings.

Bandages for various parts of the body.—*To Bandage a Finger* (¾-or 1-inch bandage).—Turn the hand palm downwards and separate the injured finger. To dress the right hand, hold the bandage in your left, and vice versa. Make two or three fixing turns by passing the bandage round the wrist from within outwards. Lead the bandage from the root of the thumb to the injured finger and up to its tip in a long spiral. Cover the finger in a series of spirals down to its root. Thence lead the bandage across the back of the hand to the wrist, on the little-finger side. Fix with a couple of turns round the wrist.

Any or all of the fingers may be bandaged thus, but between each two a fixing turn must be taken round the wrist.

Finger-tip.—If this is injured, proceed as above, but pass the bandage over the centre of the finger-tip down the upper aspect of the finger to its middle joint. Fold the bandage back upon itself and carry it over the tip again to the under side of the middle finger joint. Make three such folds, the second and third overlapping the first on either side. Fix these folds in place by bandaging from tip to root of the finger in a simple spiral and finish off as above.

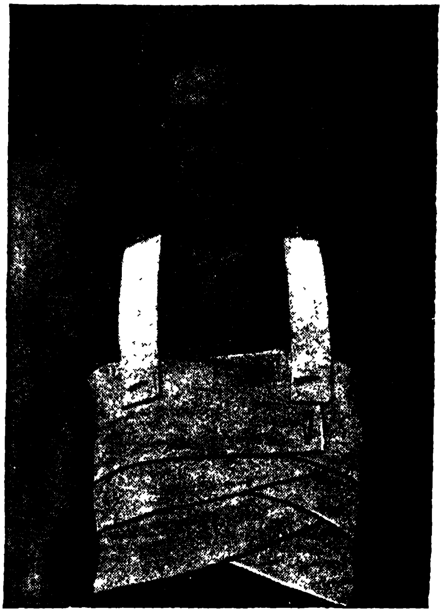
To Bandage the Thumb (1-inch bandage).—Lay the tail of the bandage across the front of the wrist. Pass the head across the back of the thumb between the thumb

and forefinger. Make a simple turn round the top of the thumb and come down diagonally across the back of the hand to the wrist. Carry on across the palm, round the thumb again and so on until the thumb is covered. Finally take a turn round the wrist and secure. This is a "spica" bandage.

To Bandage the Hand (2-inch bandage).—Stand opposite the injured hand, which should be extended palm downwards. Place cotton-wool pads between the fingers. Lay the tail of the bandage on the inner surface of the wrist and bring the roll obliquely over the back of the hand. Bandage the left hand in a clockwise, and the right in an anti-clockwise direction. Pass the roll round the little finger edge of the hand, across the palm, round the forefinger side of the hand and horizontally across the back of the fingers, so that the little finger-nail is just exposed. The bandage circles the fingers again and passes obliquely over the back of the hand and round the wrist and obliquely up over the back of the hand again. Continue this process three or four times until the figure of 8 loops quite cover the hand and wrist.

To Bandage the Closed Fist (2-inch bandage).—Place a pad in the palm of the hand and cotton-wool between the fingers. Start with two fixing turns round the wrist from within outwards. Carry the bandage over the back of the hand, round over the little finger and on to the front of the wrist at the root of the thumb. Circle the wrist and pass again over the back of the hand, the third finger, the front of the wrist, and so on five or six times. The last loop will project 1 inch beyond the margin of the forefinger. Now pass the bandage twice or thrice round the bent fingers enclosed in the loops and finish off at the wrist.

To Bandage the Forearm (2–2½-inch bandage).—Make a few fixing turns at the wrist, from within outwards. Bandage the lower forearm with a simple spiral. When the muscular part is reached, the bandage will no longer fit snugly; the lower edge will be loose. To overcome this difficulty make a reverse spiral for the upper part of the limb. Support the forearm with your free hand and bring the bandage round the back of the limb in such a way that it lies flat. While in this position place your free thumb on the bandage and bring the head downwards. Turn it over in such a way that its upper edge folds over the thumb. A "reverse" has now been made and the *inner* surface of the roll is next the skin. Pass the bandage round the forearm again and make another reverse. (The outer surface of the bandage will now be next skin again.) Continue in this manner. When the bandage nears the elbow bend the forearm at right angles to the arm, the palm facing inwards. Carry the bandage over the elbow by four figure of 8 turns. Of each, one loop encircles the top of the forearm, the other the lower part of the arm. The four crossings are in front of the elbow.



Many-tailed Bandage: Bandaging of Chest

To Bandage the tip of the Elbow (2½-inch bandage).—Lay the tail of the bandage on the inner side of the bent elbow, and pass the roll round the limb over the elbow tip. Circle the arm with a second turn and the forearm with a third, so that each overlaps the margin of the first turn. Continue these figure of 8 turns round the arm and forearm alternately until half a dozen or so are made.

To Bandage the Arm (2½-inch bandage).—Make two fixing turns just above the bent elbow. Carry on with simple spirals. If the limb is exceptionally muscular, re-

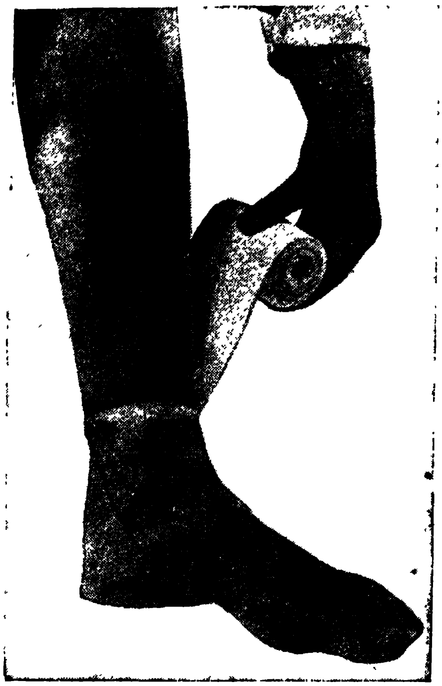


Figure of 8 Bandage for Heel, First stage



Figure of 8 Bandage for Heel, Final stage

verses may be needed. If so, make them high up on the outer aspect of the arm.

Recapitulation.—To bandage the whole arm: Begin with a simple spiral at the wrist and change to reversed spiral over the fore-arm. Use a figure of 8 to negotiate the elbow. Complete the upper arm with a simple spiral, with perhaps a few reverses.

To Bandage the Shoulder (4-inch bandage).—Place a pad of cotton-wool in the *uninjured* armpit to prevent chafing. Make two fixing turns, with reverses if necessary, round the upper arm. Carry the bandage across the back to the opposite armpit, across the chest, and round the shoulder. Continue these figure of 8 turns four or five times until the whole of the shoulder is covered.

To Bandage the Chest (4-inch bandage). —A spiral bandage on the chest tends to slip down. To overcome this split a 1½-yard length of 4-inch bandage along its centre so as to make a hole 2½-feet long. Pass this over the patient's head so that one end reaches to the small of the back, the other to well below the navel. Now take a 4-inch bandage and make two fixing turns round the lower chest and on top of the first piece of bandage. Proceed with reversed spirals well up the chest. Finish off with two fixing turns and pin the bandage in front. Turn up the free ends of the brace over the bandage and fix with safety-pins in front and behind.

If preferred, use two braces, one passing over each shoulder and finished off in the same way.

The Many-tailed Bandage.—After surgical treatment a many tailed bandage is used to retain dressings on the chest and abdomen. It has the merit of enabling the wound to be examined and the dressings changed without moving the patient. It can be made by laying several strips of roller bandage of the right length parallel to and overlapping each other. The strips are then sewn to another strip laid across their centres.

A many-tailed bandage should be long enough to go once and a quarter times round the part and deep enough amply to cover the area involved. For the chest and abdomen the tails are 3½ to 4-inches in width.

To apply a many-tailed bandage to the chest spread the bandage underneath the patient. Then cross the right and left lower

ends over each other in front. Then the second lowest pair, the third lowest and so on, each successive pair securing the preceding pair. Fix the last tail with a safety-pin.

To Bandage the Breast.—To support one breast. Take a 3-inch bandage and make two fixing turns round the body below the breasts from the sound to the affected side. Carry the third turn under the affected breast, up and over the shoulder, down the back, and round the body again. Continue until five or six turns have been made. Safety-pins may be used at intervals to fix the crossing loops in position.

To support both breasts. Proceed as for one breast, but take the bandage up and over the right and left shoulders alternately until each breast is covered by four or five turns.

To Bandage the Heel (3-inch bandage).—Support the leg so that the foot projects. Stand opposite the injured foot and place the tail of the bandage on the front of the ankle. Pass the roll round the tip of the heel from within outwards. Make a second round passing the bandage slightly above the first turn. Make a third round just below the first turn on the sole of the foot. Continue like this, the fourth round passing just above the second and the fifth just below the third. But when the fifth turn reaches the inner side of the foot, do not pass it over the instep. Bring it back diagonally over the inner side of the heel across the previous turns and pass it round the back of the ankle and down over the top of the foot from without inwards. Take the top of the foot from without inwards. Take the sixth turn under the foot and back diagonally across the *outer* side of the heel and round the back of the ankle. It is the same as the fifth turn, but in the opposite direction. Finish off with a turn or two round the ankle.

To Bandage the Foot—leaving the heel exposed (3-inch bandage).—Place the tail of the bandage beneath the sole of the foot. Make a figure of 8 by bringing the roll from within outwards over the top of the foot, round the ankle, across the top of the foot to the root of the little toe, and round under the foot to the starting-point. Now bandage up the foot in spiral turns, with reverses, if necessary, over the instep. Finish off with two figure of 8 turns round the ankle and foot pinning behind the ankle.



Bandaging: Figure of 8 Bandage for Foot

To Bandage the Knee (3-inch bandage).—There are two methods.

(*a*) *Permits movement of the joint*



Figure of 8 Bandage for Knee

Slightly bend the knee and make a fixing turn from within outwards over the knee-cap. Make a second turn *below* and half overlapping the first, and a third *above* and half overlapping it. The fourth turn overlaps the upper two-thirds of the third turn. Continue in this way until the knee is covered. Finish with a turn or two round the upper leg.

(*b*) *Restricts movement of the joint.* Raise the knee so that the roll can be passed beneath it. Make a fixing turn just below the knee-cap. Bring the bandage round the back of the knee and out to the front on the inner surface of the bottom of the thigh. Encircle the thigh and carry the bandage down over the knee-cap. Pass it round the leg just below the knee and then upwards round the lower thigh just above the knee. Carry it round the thigh and then down in a descending loop, which overlaps the last one. Continue until the knee is covered.

To Bandage the Leg (3-inch bandage).—Fix the bandage with a figure of 8 turn round the foot and ankle. Carry on up the leg with simple spirals until the bulge of the calf muscles call for reverses. Make them on the outside of the leg. Finish off with two simple spirals just below the knee.

To Bandage the Thigh.—Apply a 3-inch bandage to the thigh in an ascending spiral with reverses. Sometimes a many-tailed bandage is used. (*See also* CHEST AND ABDOMEN.)

To Bandage the Groin.—If the patient cannot stand, the pelvis must be firmly supported.

(*a*) *The St. Andrew's Cross* (3-inch bandage).—Make two fixing turns round the waist from left to right. Pass the bandage down the left groin and up behind the right buttock. Come round the waist from left to right and down the right groin; up behind the left buttock, round the waist from left to right and down the left groin again. Continue until the desired support is achieved.

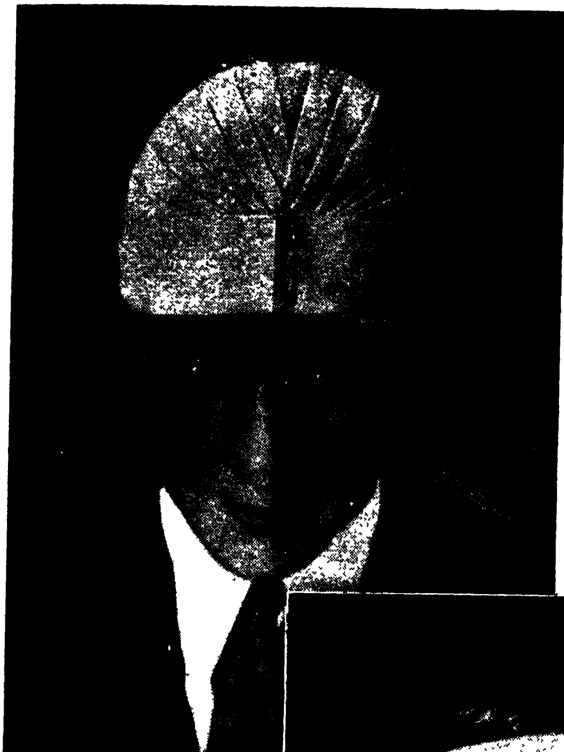
(*b*) *Single Spica*—To cover one groin.—Take a long 4-inch bandage and stand on the side to be bandaged. Make a fixing turn round the upper thigh, from within outwards. Carry the bandage up along the groin and round the back. Bring it forwards and downwards to cross the first turn directly over the dressing in the groin. Pass it round the thigh and up over the groin again, making a figure of 8. Continue these turns until the dressing is covered and secure.

(*c*) *Double Spica*—To cover both groins.—



Head Bandage: First Stage

Stand on the patient's right side, or facing him if he is on his feet. Begin as for a



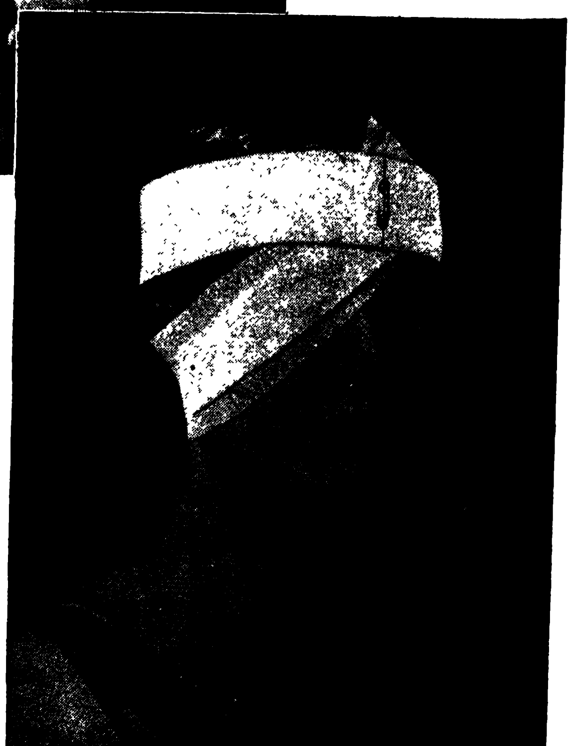
Head Bandage: Final Stage

single spica on the right side, but bring the bandage forwards and downwards over the *left* groin and round the *left* thigh. Then take it up across the abdomen to the right groin and over the first turn of the bandage. Carry it round the right thigh, behind the waist and down to the inner side of the left thigh. This completes one turn. Continue a series of such turns.

To keep a Dressing between the Legs. — Make a T bandage by stitching a piece of 4-inch bandage one yard long at right angles to the centre of another piece one and a half yards long. Tear the first piece up its centre for half its length. To apply, tie the second piece round the waist like a girdle with the knot in front. Pass the first piece between the legs from behind and tie the tails to the girdle on either side of the knot. Alternatively, use the St. Andrew's Cross. (*See also* GROIN.)

To Bandage the Chin (four-tailed bandage).—Cut off a yard from the widest bandage available. Tear from both ends down the middle. Stop when 3 inches from the centre. This will leave an undivided central portion 6 inches long.

To apply.—Place the centre of the bandage on the patient's chin. Carry the lower tails upwards in front of the ears and tie them on top of the head. Bring the



Eye Bandage to hold dressing in place

upper-pair of tails along the line of the jaw and tie behind the neck. As the bandage is 1 yard long, four ends are left over. Tie the two right ends and the two left ends together.

To Bandage the Head.—The triangular bandage is undoubtedly the most useful, but a modified roller bandage is sometimes used. Roll up a 2-inch bandage from each end, or stitch the tails of two bandages together so as to form one long, double-headed, or capelline bandage.

To apply.—Stand behind the seated patient with one roll in either hand. Place the centre of the bandage on the forehead, just above the eyebrows. Bring round the two ends and cross them well down at the base of the skull. Carry the upper end round to the front again. Turn up the other end, which lays underneath, and bring it over the crown of the head and down to the centre of the forehead. Let the horizontal portion pass over it and round to the back of the head again. Turn up the hanging portion and take it back over the crown, so that it overlaps one-third of the first strip. Cross the two portions at the back and bring the hanging portion forwards again, so that it overlaps the *other* side of the centre strip. Carry the horizontal portion on round the head as before. In front, secure the hanging portion once again and carry on backwards and forwards on alternate sides until the whole scalp is covered. Finish off by taking both ends round the head and pinning them.

To Bandage the Eye (2-inch bandage).—Make a fixing turn round the head, starting on the uninjured side just above the ear. When the starting-point is reached, bring the bandage over the affected eye, below the ear on that side, round the back of the head to the forehead again. Make as many turns as may be necessary and fix with a safety-pin. Both eyes can be bandaged by passing every other turn of the bandage below the other ear and up over the other eye, to form a crossed bandage.

BANTING.—This is the name given to a slimming diet for over-fat people, which was made popular by William Banting, a London undertaker of enormous size who lived in the earlier part of the nineteenth century. It is still very popular, although it was invented nearly a hundred years ago, and has been used by a great many people in the last few years during the craze for slimness. Before Banting discovered his diet, people had been content to accept the curse of being too fat without hope, although perhaps not cheerfully. Banting was the first person to fight against his great bulk of flesh.

In middle age he became so stout that his life was a burden to him, and active exercise only increased his appetite and made him eat more. He tried "fifty Turkish baths and gallons of physic" without any result. Then he became hard of hearing and in order to improve his deafness, he was advised to try a diet of lean meat, fish and dry toast, with the happy result that he lost 46 lb. in six weeks, and his health improved very much. He thereupon wrote "A letter on Corpulence, addressed to the Public." This pamphlet had a great success, and the expression "to bant" became a household word, just as it is nowadays. Thousands of fat people began to use his diet. In many cases the results were very successful. Such a rapid loss of weight is, however, apt to be accompanied by serious damage to the health, so that generally speaking, it is not advisable to aim at losing weight at a greater rate than 2–3 lbs. a week, or even less. (For details of Banting's diet, *see* OBESITY.)

BANTING, DR. FREDERICK GRANT.—Born in Canada in 1892, the discoverer of the method of treating diabetes by insulin (in association with Dr. Best, Dr. Collip and Professor Macleod) in 1921. A research institute in Toronto has been named after him.

BARBER'S ITCH. — Barber's itch or "foul shave" is the popular name for a skin disease, the medical names of which are sycosis, tinea sycosis, or tinea barbæ. In this disease the glands at the roots of the hair in the neighbourhood of the beard are inflamed. Many little yellow pimples are to be seen, each surrounding a hair, and the skin between is swollen and red. In bad cases the upper lip and eyebrows may be affected. The cause of barber's itch is mainly a germ of the staphylococcus group, but other germs have been found to be present. Barber's itch must not be confused with other diseases which at first sight look like it, such as impetigo, ringworm of the beard, and dermatitis.

Barber's itch is a very chronic disease and very difficult to cure. Patience and perseverance are necessary for its treatment, as

a complete cure may take two years or even more. In order to prevent it, any redness or spot in the region of the beard, however slight, should at once be treated with a disinfectant lotion.

Treatment.—The hair of the beard should be clipped as short as possible. This may be very painful but it is well worth being able to shave, as the absence of hair gives so much better opportunities of treating the disease. An antiseptic soap should be used, and if possible the hair in the centre of each pimple should be pulled out before shaving. This may, however, be too painful and may tear the skin, in which case it should not be attempted in case further inflammation arises. An antiseptic ointment must then be rubbed in, and it is very important to rub the ointment thoroughly into the skin. Even a weak ointment, thoroughly rubbed in, is better than a strong ointment if it is only smeared on. Rub the ointment in twice a day for ten minutes at a time. This treatment, if continued long enough, should cure simple cases.

Vaccines may be tried for more severe cases, and are often very useful—especially if they can be made of the patient's own germs (autogenous vaccines). Injections of the vaccine are usually given once a fortnight. In severe cases X-ray treatment is also used and is generally very successful.

When they are nearly well, patients sometimes get slack about their treatment and begin to neglect it. This is a great mistake. The treatment must be continued until the disease is absolutely cured, and even then it is wise not to begin to grow the beard again (if one is worn) for at least a year afterwards. Barber's itch is usually found in delicate or temporarily run down men, so the general health must be carefully looked after. A daily dose of salts will be found useful and frequent baths should be taken to keep the skin in healthy working order. Tonics, good food and exercise in the open air are all helpful.

A useful ointment for rubbing in is white mercurial ointment.

BARBITONE.—This drug is better known as veronal, and although looked upon generally as a harmless hypnotic, it is sometimes uncertain in its action and should be used with care. Other drugs which are derived from barbitone and are popularly used as sleeping draughts are luminal, dial, medinal, allonal, phanodorm and veronal, and these drugs should not be used unless advised by a doctor.

Cases of acute fatal poisoning have occurred owing to an overdose of barbitone, but fatalities rarely follow unless the dose has been as large as 50 grains or so. Deep coma may result lasting for two or three days, and paralysis of the organs used in breathing may develop. A common result of an overdose is the development of bronchopneumonia. In cases of poisoning, the stomach should be washed out with warm water, and hot strong coffee and about one ounce of castor oil should be given through a stomach tube. If the pulse is feeble oxygen may have to be administered.

BARIUM MEAL TEST.—Barium is a heavy, white, odourless powder which is insoluble in water and, being mineral, can be seen by the X-rays. It is used therefore to obtain photographs of the working of the digestive system. A bowl of barium powder is made into a porridge and is swallowed by the patient, who is then photographed under the X-rays at intervals of a few hours during the next twenty-four hours. By this means a series of photographs of the solid stream of barium are obtained in its complete journey through the stomach and bowels until it reaches the rectum and is expelled from the body. The radiologist can thus see the various organs at work and can tell whether they are working properly and, if not, in what region and in what way they are going wrong.

BARKING COUGH.—This is a dry, hoarse cough which sounds exactly like the bark of a dog. It may be due to laryngitis or to food crumbs which "have gone down the wrong way," but is more usually met with in cases of hysteria.

BARLEY WATER.—Barley water is one of the most useful drinks for invalids in diseases where a large quantity of thin bland liquid should be drunk, as for instance in inflammation of the bladder and cases of fever. A recipe for making barley water together with other invalid recipes will be found in the supplement on DIET AND INVALID COOKERY.

BARLOW'S DISEASE.—This is a term, called after Sir Thomas Barlow, physician in succession to Queen Victoria, King Edward VII and King George V, used to

denote scurvy in infants. The symptoms of it are bleeding into the skin and mucous membranes and there is usually rickets as well. Scurvy generally develops in infants who have been fed on boiled, dried or condensed milk and have not been given enough fresh fruit juice to supply the vitamin which is present in fresh milk or mother's milk but is missing in boiled or dried milk. (*See also* SCURVY.)

BARRENNESS.—The state of being unable to bear children. The reasons for this are discussed under the heading STERILITY.

BASEDOW'S DISEASE.—Basedow's disease, called after a German physician of the early nineteenth century, is another name for exophthalmic goitre. (*See also* EXOPHTHALMIC GOITRE.)

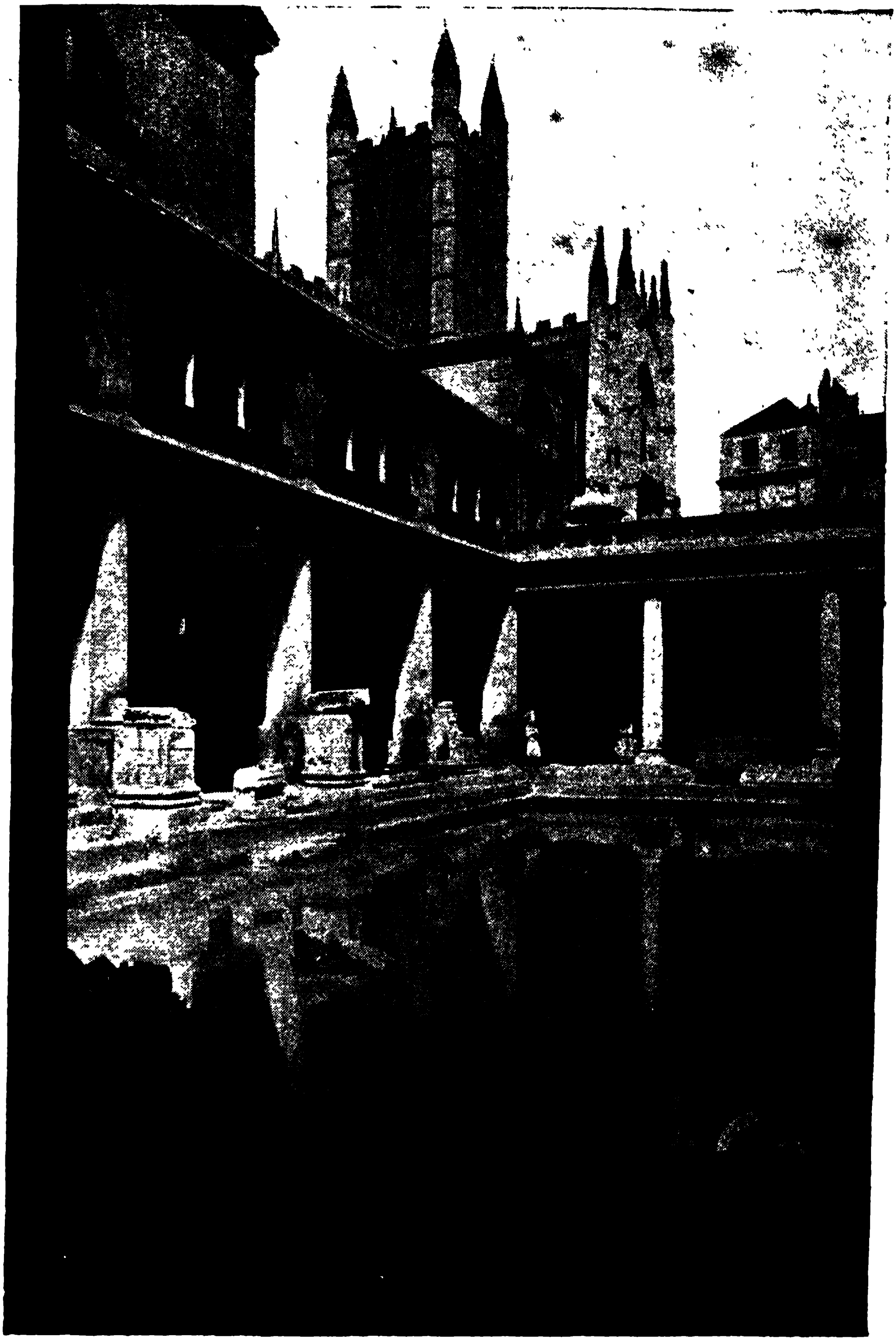
BASILIC.—When applied to a structure or a drug this term means important or prominent. The basilic vein is a large and important vein of the arm on the inner side of the muscle called the biceps, and is the vein generally opened for blood-letting in the operation called venesection, which will be described under that heading.

BASILICON OINTMENT.—An ointment composed of resin, yellow wax and lard. It is used for chronic ulcers, sores and sometimes for wounds.

BATH.—In this country there are several spas which now compare favourably with the spas on the Continent, but perhaps the most famous for its natural advantages and its interesting history is Bath, in the county of Somerset, near Bristol. For at least two thousand years the hot chemical waters have bubbled unceasingly out of the ground, and people have gone to them for healing. The water comes out of the ground at such a great heat that it has to be considerably cooled off before people can bathe in it. In the times of the Romans, great baths were built here, and the bathing station was called Aquæ Sulis. The Roman Baths are still to be seen, and give a wonderful insight into the lives of the Romans. Newer bathing establishments have been built from time to time over and round the Roman one. Bath has had its ups and downs like other places, but its hot and soothing waters have always been appreciated. In the reign of Elizabeth, a hospital was founded for the treatment of poor people suffering from diseases for which treatment at the Spa would be of benefit, and this hospital continues to-day. In the reign of James the Second, the king, despairing of a child by his second wife, Mary of Modena, sent her for a long residence at Bath, after which the longed-for heir to the throne was born, who became known in later life as the "Old Pretender." In the days known as the Regency period, at the end of the eighteenth century, when George the Third had become too old and feeble to govern, and his eldest son (afterwards George the Fourth) was Regent, Bath had a period of great prosperity, when the town as we know it now was mostly built, and a new Pump Room was added as well as the great Assembly Rooms, and the streets of grey-stone houses. It is specially suitable for the treatment of rheumatic conditions—especially arthritis and joint conditions—and is a good place for residence after living abroad and for convalescence generally. This spa has the great advantage that it remains open all the year round, and as careful arrangements are made for the care and entertainment of patients in the depths of winter as in the summer season. It has also two climates, since the Pump Room itself and the baths are in a sheltered hollow, which gives the air a sedative and relaxing effect, thus making it very suitable for one class of patients, whilst the bracing air on the hills on which Bath is built make the higher levels of the town suitable for patients who require a stronger air.

The real value and fame of Bath, however, depend upon its waters, which are the only really hot natural waters in the British Isles. Their temperature is 104°–120° Fahr., whilst those of Buxton and Matlock are only lukewarm, being 82° and 68° respectively. They contain an unusual amount of calcium, and also an unusual amount of nitrogen gas, as well as carbonic acid gas and a little radium activity, in addition to the other chemicals which are usually found in medicinal waters.

The typical form of bath at Bath is the deep one, in which the patient walks down steps into a bath which is filled to the level of his neck when standing. In this he is encouraged to perform exercises with his stiff joints, and may also be massaged under the water with a powerful jet of water directed on to the part to be massaged by the attendant. After the deep bath he is wrapped limb by limb in very hot towels and



THE ROMAN BATH AT BATH

The springs at Bath have been used for curative treatment since the Romans came.

soon sweats freely. Besides the deep bath, every other form of bath and spa treatment is efficiently catered for, and almost every form of disease which is benefited by spa treatment can be well treated at Bath. (*See also* BATHS AND BATHING.)

BATHS AND BATHING.—The custom of bathing, both for cleansing and for medicinal purposes, dates from very early times. Bathrooms have been found among the ruins of ancient Egypt, and in Greece there are well-preserved examples dating from about 1500 B.C. Later on, when Greece and Rome were at the height of their power, bathing played a great part in the life of the people. The Romans, especially, made their baths into great social centres, and used them not only for bathing but also for a meeting-place in which to do business, meet one's friends and listen to lectures and concerts. Their type of bath was very like the Turkish or Roman bath of to-day, and their methods of water supply, drainage, etc., were surprisingly "modern."

As we know, the Romans introduced bathing into Britain, and their baths at Bath in Somerset are still to be seen in a splendid state of preservation. Apparently the inhabitants of Britain did not take kindly to the custom, because there is no record that we ever bathed (in water, at least) after the Romans left the country. In Tudor times, and up to the time of Oliver Cromwell, the great ladies of the court bathed in wine for the sake of their beauty, and their daughters bathed in milk, but otherwise there is no doubt that "for centuries the world had stunk considerably. . . ." Just imagine how unhealthy the world was then. Epidemics of every sort were numerous and horrible diseases like smallpox and plague were common. With the coming of the Industrial Revolution, however, in the 19th century, there also came a new desire for personal cleanliness. Private houses still lacked baths, but to compensate for this, public bath-houses were built, consisting of a number of small bathrooms controlled from a central office. Later, as athletics came more to the fore, shower-baths and a swimming-pool were added, and when the custom of having a bathroom in each house became general, the number of small bathrooms decreased.

Baths and Health.—Baths have an effect on the system by improving the action of the skin. The nerves of the skin control the temperature of the body by distributing heat over the surface of the body and by evaporating moisture from it. The main use of water is to act as a carrier for heat, and baths act chiefly by giving to, or taking from, the heat of the body. The skin also has the very important function of helping to rid the body of some of its waste products. It has been calculated that, even by means of the ordinary daily perspiration which is so small in amount as to be unnoticeable, one-twentieth of the nitrogenous waste of the body passes through the skin. When the skin is acting more freely and the perspiration can be seen in drops which are called sweat, the body can naturally get rid of still more of its waste. The activity of the skin can be increased by baths of a high temperature.

Baths, given at different temperatures, also have a powerful effect on the circulation of the blood, and can be used to improve it to a great extent. The same applies to the nervous system, which can be affected by heat and other influences which are employed in electrical, chemical and mechanical baths.

Kinds of Baths.—Baths may be taken in fresh water, which may be cold, tepid, warm or hot; they may be taken in sea or other salt water, either hot or cold. The waters of many mineral springs all over the world are used for baths at various temperatures. These contain chemicals in large quantities which are useful in treating different diseases. Some of these mineral water baths are in still water, but others which contain carbonic acid are bubbling and foaming. There are also solid baths, such as sand baths, semi-solid baths like mud or peat baths, vapour, hot-air and sun baths. For medical purposes, baths are given in acute diseases with great fever, to reduce the temperature. In chronic diseases like Bright's disease, they are given to increase the action of the skin and promote sweating, thus resting the kidneys as far as possible. In rheumatism and neuritis they help to relieve pain, and in various nervous conditions they are used to calm or stimulate the patient. Certain baths are of the greatest use in skin troubles. To discuss all the varieties of baths in detail would require a book rather than an article, but a short description will be given of the more common and important baths, with

their uses. Different people feel the heat differently, so in cases of illness where absolute accuracy is desirable, a thermometer should always be used.

Cold Baths.—A cold bath is one at 60° F. The cold tap temperature is fairly correct in summer, but may be much less in winter. Its daily use (in health) is a great aid to vigour and natural resistance to such infections as "the common cold." (It does not, however, *prevent* colds, as is frequently and incorrectly said, any more than it prevents smallpox.) It should be taken while the body is warm, the usual time being on rising. If preferred, a warm or tepid bath may first be taken, followed by a cold shower or sponge-down. The duration, depending on the season, should be from a few seconds to two minutes. The bather should rub himself vigorously while in the bath, use a rough bath-towel (linen, not Turkish, being preferable), and dress rapidly.

The skin should look pink, and a warm glow should be felt for an hour or two afterwards. This is known as a "healthy reaction," and signifies that on contact with cold water, the blood-vessels in the skin first contract, and then dilate quickly, to make good the surface heat lost. In persons whose reaction is not good, one of two things may occur: either the dilatation is too great, so that the blood in the full vessels of the skin becomes unduly cooled, after a temporary feeling of warmth, and chill and tiredness result; or the contraction is not followed by dilatation of the vessels, and the bather looks blue and feels cold. The latter effect can often be prevented by taking a tepid bath before a cold shower; this, too, is the best method for those liable to chills and colds.

Some years ago the cold bath was almost too popular, but now it is used in a more sensible and limited fashion. It is excellent for healthy people whose circulation is good, and whose ages lie roughly between ten and sixty. It is definitely bad, as may readily be understood, for the aged and the very young, for people in weak health, and for people whose blood-pressure is high, whether from the natural increase of later middle-age, or because they are of the apoplectic type.

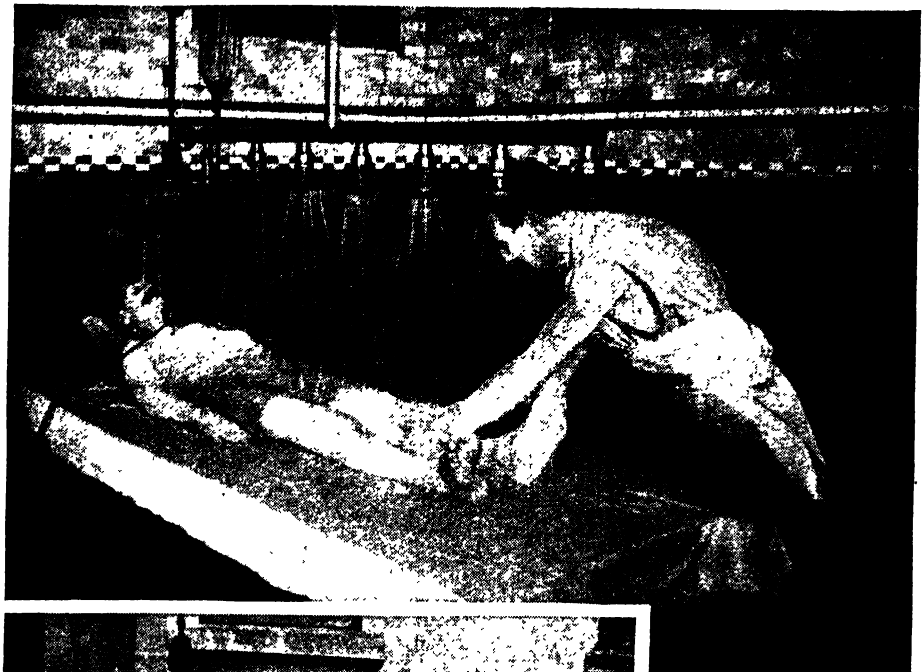
Cold sponging, packs, or baths are used as a means of reducing the temperature in cases of fever, when it becomes dangerously high. None of these methods should be attempted unless by a trained nurse or by medical advice, and the pulse and temperature should be watched with great care, to avoid the possibility of collapse. When the temperature has fallen to 102° F., the treatment may be stopped; in no case should it continue for longer than 15 minutes at a time. In *cold sponging*, the patient should lie on a blanket covering a mackintosh sheet, and be covered with another blanket. He should be sponged all over, beginning at the face and working downwards, and only uncovering one part at a time. After sponging, the skin should be gently dabbed to remove most of the water, but left moist. He should be put to bed in dry clothes, and given a cold drink.

For a *cold pack* the bed should be prepared as before. The patient should then be wrapped in a sheet wrung out of cold water, and a cradle covered by a blanket placed over him. As the sheet becomes warm, it must be replaced by a second cold sheet. The reaction, especially the temperature, should be carefully noticed, and if any shivering be observed, the cold sheet should be removed, and replaced by warm blankets and hot-water bottles.

The *cold bath* is the most rapid method of reducing a high temperature, and also the most dangerous unless carried out with the greatest care. The patient should be lifted into the bath on a sheet by four persons. The water should at first be only a little lower than the normal body temperature, and lowered by adding cold water. It should not be less than 80° F. It is often advisable to give a stimulant before putting the patient in the bath.

Tepid baths are those at 90° F., i.e. slightly below body temperature, which is 98·4° F. In addition to ordinary use, it is employed medicinally as a means of raising the blood-pressure and calming the nervous system. It is especially useful in some cases of delirium or mania. The patient is placed in water at body temperature, which water is gradually cooled to 90° F. The duration of the bath depends on the reaction, but the first lasts generally about 30 minutes, and the time may be increased to eight hours daily.

Warm baths are those from 98·4° to



Above:

Vichy Douche called after the famous Continental Spa

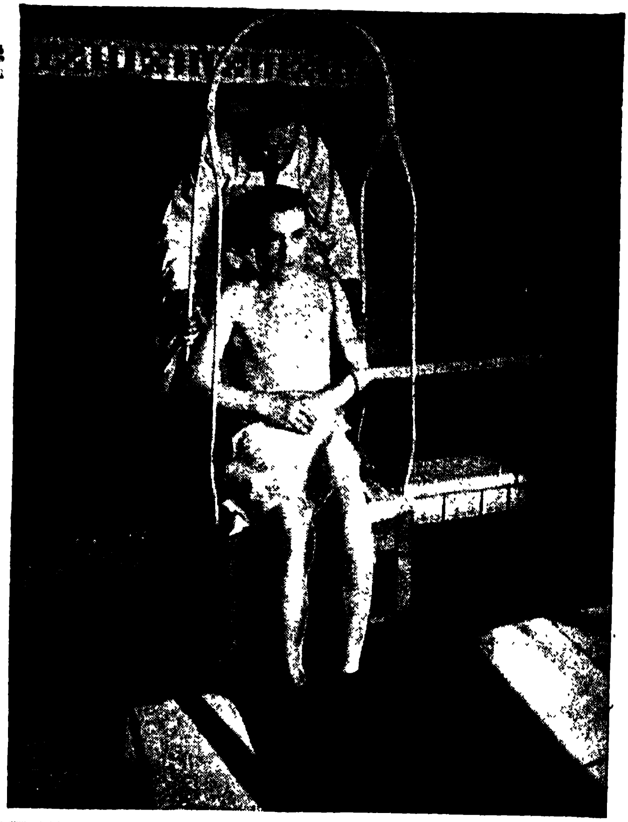


SPA TREATMENT

On Left:

Patient receiving Manipulation Treatment under water

On Right:
Helpless Patient being Lowered into Deep Bath



SPA TREATMENT

Below:
Foam Bath for the Treatment of Rheumatism and Slimming



110° F. Water at 115° F. can be borne by the hand, but not by the whole body. The warm bath reaction is quickening of the pulse and an increased flow of perspiration. After long immersion in the hot bath, the heart tends to be weakened; very warm baths, therefore, should not be used by people who have any form of heart disease. To prevent stiffness after exercise, or to "ward off a chill," a bath of 104° F. should be taken for 10–15 minutes, followed by a cold shower. To reduce the blood-pressure in kidney disease, a bath of 100–110° F. is used; this is also found to relieve the mental depression in melancholia.

It must be noted that a *long* immersion in either hot or cold water is often followed by great depression, both physical and mental. This does not, however, apply to the tepid bath treatment, discussed above.

Other varieties of water baths are the *Sitz bath*, which may be used at any temperature from 60° F. to 100° F. The duration is from 2–10 minutes. The patient should have his feet and shoulders covered, to avoid chill. This bath is used for varying conditions of the lower parts of the body. The *shower bath* at 100° F., 1–2 minutes, is a powerful stimulant, valuable in sluggish chronic conditions, but unsuitable for the acute stage of any disease. The *warm* or *tepid shower* is valuable for chronic joint affections. The *cold shower* 50–60° F. may be used after a warm bath, as has been described, to avoid chills and to tone up the system. In inflammatory conditions it acts as a sedative. Any of the above can be combined with *massage* (as at Aix or Buxton); or hot and cold may be alternated, as in the *Scotch* or percussion douche. This consists in an alternating douche of water at 60° F. and then 100° F., which lasts for 2 minutes, and alternates six times to the minute. The *needle bath* is really a very strong shower bath, with temperatures and duration as in the shower. There is also the *descending douche*, which is directed especially on to the spine; the *ascending douche*, which is used for colitis, piles, and prolapsus ani; and the *douche interne*, which is employed for womb troubles. The *underwater douche* is a very valuable method of treatment, especially in mineral-water baths. The temperature is from 96–110° F., and the duration 15 minutes. It is really a kind of water massage, where a cushion of water is between the end of the douche nozzle and the affected part. It is especially useful in painful conditions which cannot stand ordinary massage.

Water vapour baths act in the same way as a hot bath; they have no special virtue. They may be taken, however, at a higher temperature (108°–120° F.), and for a longer period (15–20 minutes), and are borne without discomfort. This is due to the profuse sweating which helps to keep the body cool. They may be taken in various ways. The home-made tent of blankets, where the patient sits a few inches above a pan of boiling water, is as efficacious as the Russian bath with its vapour-filled rooms. Cabinets are also used, in which the patient sits with his head protruding through a hole in the lid while steam circulates around him, which may be perfumed by adding lavender, fir-balsam, and so on, to the boiling water. Great care should be taken not to get chilled after a vapour bath. At a Russian bath a cold douche is given immediately afterwards. The vapour bath is useful in some cases of Bright's disease. Here, the patient should not take a cold douche, but retire immediately to bed between warmed blankets.

The *hot pack* acts in very much the same way as a vapour bath, though its preparation is quite different. It is very useful in home nursing, when the patient is not well enough to sit in a vapour bath. A blanket should be placed over a mackintosh sheet on the bed, and the patient wrapped in a sheet wrung out of very hot water. Over this should be placed dry blankets, and he should be surrounded by hot-water bottles for 30 minutes. Copious perspiration should result. At the end of the time, the patient should be rubbed down with a hot soft towel and reclothed in warm woollen night-clothing. The rubbing-down, remaking the bed, and so on, should be done as quickly as possible, to avoid chilling the patient.

Hot dry-air baths are generally taken in the form of Turkish or Roman baths, which are unchanged in essentials from the originals so many hundreds of years ago. They consist of a specially constructed building heated by pipes in the walls, and with tepid, hot, washing and cooling rooms,

through which the bather passes in turn. The whole performance takes about two hours and should be followed by a feeling of refreshment and well-being. These baths are very useful for reducing fat people, and as much as six lb. may be lost at one time. They should never, however, be taken for this purpose without medical advice, as a fatty exterior denotes some degree of fatty heart, and the consequences may be distinctly harmful. In chronic rheumatism they often give great relief.

A hot-air bath may be given in a cabinet wherein the patient sits exposed to brilliant electric light which produces great heat, till profuse sweating takes place. Afterwards (in ordinary cases) he should have a cold shower. Such baths may be given to a bedridden patient for various conditions. In hospitals wire shields are used, which cover the patient to the neck, and whose under surface is studded with electric-light bulbs which quickly raise the temperature of the enclosed air to a high degree. Another form consists of a shield, through the foot of which passes a funnel which conducts hot air from a large spirit-lamp placed at the foot of the bed. The patient lies on blankets, and the shield is completely covered by asbestos cloths or blankets. Hot-water bottles (protected by a cover) are placed beside the patient. This type of bath gives a temperature of 200° F., which in dry heat can be borne for 15 minutes. It is very useful in promoting the action of the skin in Bright's disease, and gives excellent results in chronic rheumatism and sciatica, and considerable relief from the pain of rheumatoid arthritis. Small shields may be used to treat a limb separately. If the patient is very ill, it is necessary to examine the pulse in the temple frequently, in case the heart becomes enfeebled.

Sand baths are another form of hot dry bath, and are used in forms of chronic rheumatism. The sand is heated to a high degree, by which it is purified, and when cool enough to be borne, the patient is "buried" in it. They are not so popular as some of the other forms, however, as they are inconvenient to use.

Artificially medicated baths probably originated in ancient Egypt, where the terrific heat necessitated their use, and were followed by a liberal application of perfumed oils and ointments. They were doubtless employed to give the skin more elasticity, as well as for purposes of refreshment. Nowadays, they are much used in various cases of disease, and may be given at home or in hospital, or (where means permit) at one of the numerous spas now in existence, each of which has its "speciality." They will be more fully discussed, if necessary, in the treatment of the respective diseases for which they are used; the general indications only will be given here. There are, too, many variations in their preparation, but in each case the simplest or the cheapest method has been chosen. For the sake of brevity, also, in each of the following baths (unless otherwise stated) the quantity of water is 30 gallons, i.e. the usual amount used in a bath; the temperature is 98–100° F.; and the duration 15 minutes.

Alkaline baths. — Sodium carbonate (washing soda) 4 oz. These are useful in dyspepsia, gout, and "sluggish liver." It acts by softening the skin and permitting freer action. A stronger bath is made by using sodium carbonate 5–10 oz., or soft soap, ½ lb., which is used in skin diseases where there is great thickening of the skin, or to remove scales.

Bran baths.—4 lb. of wheaten bran are tied in a muslin bag, and well pounded and shaken in 10 gallons of nearly boiling water. The added 20 gallons brings it to the proper temperature. The duration of this bath is 20 minutes. It is very soothing in cases of general inflammation of the skin. *Starch* may be used for the same purpose; ½–2 lb. is crushed and mixed with cold water before adding to the bath.

Brine baths.—Sea-salt or common salt, 9 lb. The latter is cheaper, but not quite so satisfactory. These baths may also be had at various spas, and they are frequently in combination with bromine and iodine. They are very stimulating, and are useful in debility, chronic rheumatism, and some forms of glandular enlargement. Weakly children may be benefited by their use. (*See also* SEA-BATHING.)

Calomel baths are used in cases of syphilis. They are a modified vapour bath: 20 or 25 grains of calomel are placed on a metal plate above the lamp and vaporized, while the patient is in a cabinet or a "tent" of blankets, with the head outside.

Creolin baths.—Creolin, 4 drams, added to the bath.

Coal tar baths.—Liquor carbonis, 8 oz.

Vinegar baths.—Vinegar, 1 pint. These are all very useful in certain forms of skin disease, accompanied by much itching.

Carbon dioxide or Effervescing baths.—Sodium chloride (common salt) 9 lb., calcium chloride 15 oz., sodium bicarbonate (baking soda) 12 oz. Mix in the bath, and when dissolved, add hydrochloric acid 6 oz. Or carbon dioxide in cylinders may be allowed to escape into the water, but this method, though convenient, is far more expensive. This type of bath may be administered by the aid of naturally effervescent water, such as is found at some spas. It is greatly in vogue for cases of heart disease with high blood-pressure; the circulation in the skin is greatly increased, and the blood-pressure diminished. It is also recommended for general debility, anæmia, and neuritis.

Mustard baths.—½ oz. to 1 gallon, as a footbath to check colds. ¼ lb. to 30 gallons of water as a good general stimulant. The mustard should be mixed before adding to the bath.

Peat baths, which contain much iron.

Mud baths, which contain sodium chloride, iron, arsenic, and sulphur. These are given at various spas. The patient is covered with a layer of mud or peat warmed to 102°–112° F., for 20 minutes, then washed by the cold douche. The effect of these is aided by the greater sense of pressure. They are used for chronic rheumatism.

Pine baths.—Extract pini sylvestris, 3 oz., may be added to the bath; or several pounds of pine needles may be boiled, and the water strained and added to the bath. Sometimes a tepid bath is ordered. This acts as a pleasant stimulant.

Sulphur baths.—Potassium sulphurata, ¼ lb. This gives off sulphuretted hydrogen in the water, which stimulates the skin, and is slightly absorbed. It is good for some cases of skin disease, rheumatism, and constipation. (It should be remembered that sulphur has a harmful action on iron baths: the preparation known as Sulphaqua is largely free from this disadvantage.)

Electric baths.—(*See also* ELECTRICITY.) Here the bath itself must not be metal—as various cases of accidental electrocution have shown—but earthenware, stone, or wood. The water is tepid. A guarded electrode is placed in the water at each end of the bath, and the current required passed through. There are several methods of giving the electric bath, according to what disease is to be treated. They are excellent in debility and neurasthenia.

Foam baths.—This is one of the newest and most popular forms of water treatment, but is more in the form of a luxury than a necessity. In it the patient lies covered to the chin with a snow-white foam, which is produced by the bubbling of air through water to which chemicals have been added. It is an excellent slimming treatment and is also useful in cases of rheumatism and other diseases where the patient is unable to stand the strain of an ordinary hot bath.

BATH SALTS.—Bath salts have become very fashionable of late years and can be had in every colour and perfume, as well as at prices to suit all purses. They are used as water softeners and for their mild perfume. The great majority of them are made from monohydrated sodium carbonate, which is closely related to the ordinary washing soda used in every kitchen to soften water.

BAY RUM.—Bay rum is a hair-oil obtained from the oil of the Bay. It is used a great deal in the treatment of greasy scalps and other conditions, and also to impart an agreeable smell to many toilet preparations.

BAZIN'S DISEASE or "SHOPGIRL'S DISEASE."—Under this name two diseases are grouped. The first occurs in girls and young women whose occupation involves a great deal of standing. These girls frequently have a family history of tuberculosis, and they themselves may show symptoms of tuberculosis, such as enlarged glands, and the germ of tuberculosis has been found in the ulcers that appear on the legs. The girl is frequently delicate and anæmic. In these cases the skin at the back of the legs between the knee and ankle is affected usually on both legs. The condition begins by the formation in the skin and soft tissues beneath the skin of livid, bluish, hard lumps or nodules, as they are called. These nodules grow larger, then soften and turn into ulcers. The skin over them "sloughs" or comes away, leaving a small open sore with ragged edges. Fresh crops appear near by, and they in turn

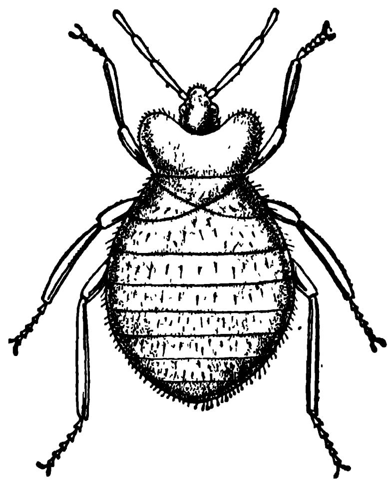
become ulcers. In the nodular or lumpy stage of the disease there is pain, but not in the ulcerated stage.

The second variety of Bazin's disease is found most often in fat women with inflamed varicose veins, "bad legs" as they would call them. In appearance this form is the same as the other, but it is not tuberculosis in origin. The treatment of both forms is much the same.

Treatment—If it is left untreated, the disease may spread widely over the calves of the legs and may last for months and years. In these neglected cases the affected tissues are better removed by operation and skin from some other part of the body grafted over the area. If seen early, the condition will improve rapidly under treatment, though relapses are common unless the general condition of the patient is improved. The treatment consists chiefly of rest in bed and generous diet. The legs should be raised on pillows. For the tubercular type, cod-liver oil and tonics are advised; where the varicose veins are the real cause of the trouble, these may be suitably treated. The use of strapping, with or without Ichthyol paste, often promotes healing of the ulcers. (*See also* TUBERCULOSIS; VARICOSE VEINS.)

BEARDS.—Beards have so much gone out of fashion amongst younger men that not so long ago a young bearded man would be greeted with cries of derision from rude children if he ventured to appear before them. The reasons for the disappearance of the beard are to be sought largely in the increased knowledge of hygiene and also in the increased use of machinery in all forms in our daily life. The bearded man would be in danger in many up-to-date factories, just as in the days of long-haired women the bonny Lancashire lass had to pin her tresses closely to her head for six days of the week, lest she be caught by her hair and whirled into the machinery. With regard to the point of view of hygiene, the beard is in a particularly favourable position for picking up and harbouring all sorts of undesirable matters, and to secure its perfect cleanliness at least as much care and trouble is needed as that required for the daily shave. In a previous age men with delicate throats and lungs were ordered by their doctors to wear beards in order to protect their throats. The exactly opposite course is now known to be the better one and the delicate throat and lung is treated by constant exposure to fresh air. The beard is subject to the same skin diseases as other hairy parts of the body, but one disease which is particularly associated with the beard is called BARBER'S ITCH and is described under that heading.

BEAT HAND.—Beat hand, beat elbow, and beat knee are terms applied to an inflamed condition which arises through constant pressure and friction caused by handling tools. It is a very common complaint among miners, but occurs in other trades also. The condition is a painful one, and unless it is treated early by the application of suitable antiseptics, surgical measures may have to be taken. (*See also* BURSITIS; TENNIS ELBOW.)



Bed-Bug

BED-BUGS.—These insects may develop into a source of great danger and annoyance if measures are not promptly taken to destroy the eggs as well as the insects themselves. The full-grown insect is of a brownish colour, very flat, and may vary in size from about a twelfth of an inch to a sixth of an inch in length. The bed-bug gives forth a disagreeable smell which seems to fill the whole room, and is quite characteristic. In common with other troublesome insects, the bite may or may not cause annoyance to persons who come in contact with it. Some people, it is true, are able to live in the most bug-infested areas without showing the least sign of having been bitten; while other

individuals suffer intense agony from irritation and spots which never cease to require scratching.

Not only is the bed-bug an unpleasant visitor to have in one's house, but as a carrier of disease it must be looked upon as extremely dangerous. After it has been feeding on the blood of a person suffering from fever or any other infectious disease, it will spread the germs in the most indiscriminate way to other persons whom it may bite.

Drastic measures may have to be taken in order to rid a house of this pest. Mere simple cleaning will not be found enough, as these little creatures lurk in the skirting-boards and flooring. The premises which are to be cleaned must be thoroughly dismantled and all possible breeding-places must be treated with crude creosote of tar. All furniture, especially if made of wood, should be washed with soap and, after it is thoroughly dry, turpentine should be applied to all holes and cracks. Sulphur fumigation is also an excellent way of disposing of bed-bugs, or kerosene may be used. Should clothing require treatment, this may be carried out by soaking the garments in a Lysol solution. In order to relieve the intense irritation caused by the bites of these insects, the parts may be bathed with dilute ammonia or toilet vinegar. (*See also* Bites.)

BED-CRADLE.—In certain cases, such as fracture of the limbs or painful abdominal conditions, it is necessary that the bed-clothes should be lifted from off these particular parts of the body. A bed-cradle is used for this purpose. It is a cage-like arrangement, made of wooden or metal struts. In cases of emergency, an ordinary foot-stool with legs can be used for this purpose.

BED-MAKING.—In the daily life of the invalid as well as of the healthy person there is nothing which so much adds to his comfort as a really comfortable bed, and even the most expensive of well-sprung mattresses will be useless if the clothes which cover it are perpetually rucked and tumbled. It may be thought that bed-making is beneath notice in a health book, but any careful housewife will acknowledge that bed-making needs knowledge and care to be properly done and that these qualities are very often lacking. The proper way to make up a bed for an invalid will therefore be described in the article on Sick Nursing.

BED-PAN.—In cases where it would be harmful for the patient to get out of bed, a bed-pan should be used. It should be slightly warmed—hot water poured over it would take the chill off in a few seconds—and for greater comfort the margin should be covered with flannel. After use, it should be emptied as soon as possible and well rinsed out with a disinfectant fluid. (*See also* Disinfectants.)

BED-REST.—An improvised bed-rest can be made by placing a chair upside down at the top of the bed and laying pillows along its back. This is only recommended in cases of emergency. For longer use, a properly fitted bed-rest would be more satisfactory for the patient.

BED-SORE.—Bed-sores can develop into a very serious condition, especially in a patient who requires all his energy and strength to cope with the condition which has caused him to be bed-ridden. Any sign of redness on the skin of a person who has to stay in bed for some time should be attended to immediately, as once a bed-sore commences, it is very difficult to get rid of.

The prevention of bed-sores depends very largely on good and efficient nursing, but there are certain conditions, such as complete paralysis, etc., in which they may make their appearance towards the end of the illness. When the circulation becomes poor and the vitality of the patient is low, bed-sores will undoubtedly make their appearance unless the greatest precautions are taken.

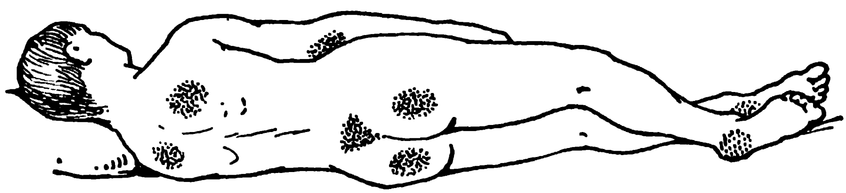
All prominent parts, such as the spine, shoulder-blades, hips, heels, elbows, etc., are especially likely to become sore, and these parts should be given attention. The patient should be washed, and before the skin is dried, the nurse should soap her hands well and gently massage the back and hips. The movement should be round and round in order to encourage the circulation of the blood where it has been hindered by constant pressure on the bed. In order to harden the patient's skin, the soap should be left on unless it creates irritation. It will be found better to dry the skin by dabbing it with a towel instead of rubbing, as the rough towel is apt to crack the skin, and a bed-sore may be the result. When the skin is thoroughly dried, it should again be thoroughly rubbed

with methylated spirits, or eau-de-Cologne. Finally, the body should be dusted with some fine powder, such as zinc, white fuller's earth, or talc.

In very old people or patients in a feeble state of health, bed-sores may appear in spite of all precautions. They should be looked upon as a serious sign and reported to the doctor immediately.

If in spite of all precautions a bed-sore appears, the slough should be removed by warm boracic lint or eusol dressings until the surface is clean. After this a return should be made to dry dressings, such as boracic acid or aristol powder, with a large cotton-wool pad over the sore.

In cases where a patient is likely to be kept in bed for some length of time, it may be necessary to use a water-bed in order to relieve any pressure on the body, but much can be done by judiciously moving the patient from time to time and by placing air-cushions underneath various parts.



The places where Bed-Sores may develop

As moisture on the skin will quickly lead to the formation of bed-sores, it is important to see that proper care is taken in cases where there is any incontinence of the bladder. In such cases absorbent pads should be placed between the patient's legs, and a soothing ointment such as zinc should be used in place of the methylated spirits.

It cannot be too deeply impressed on the nurse that above all things prevention is better than cure, and in this way only can she save herself and her patient endless worry, work and pain.

BED-WETTING (ENURESIS).—This condition may occur in children after the age when they should have control over their own bladders. It appears to be more common among boys than girls. In some cases it is difficult to cure and the greatest care and tact are necessary in the handling of the child. It is extremely unwise to punish hastily when bed-wetting occurs, as it is very often a matter beyond the child's control.

Treatment.—Proper attention to the bowels during the day and regular emptying of the bladder, is the first important step in treatment. The diet should be nourishing but not irritating, and fluids should not be taken for a few hours before bedtime. The child should be made to empty the bladder before going to bed and should be waked to do so after a few hours sleep. It is wrong to make the child feel that it is doing something unpleasant, as this often increases the child's nervousness and makes the complaint worse. The co-operation of the little patient may be gained by kindliness, and his own eagerness to obey his mother's wishes will do much to bring about a cure. Many drugs are used to try and cure children of bed-wetting. Amongst the ones generally used are belladonna, hexamine, alkalies and thyroid extract. Treatment by suggestion and hypnotism have been tried with quite good results. If the child is a boy with a tight foreskin, the simple operation of circumcision will probably cure him of the habit. Sometimes removal of adenoids will bring about a cure, by the good effect on the nerves. (*See also* BLADDER, DISEASES OF.)

BEEF.—In various forms beef juice is a very valuable addition to the diet of ill people and convalescents. Recipes for making beef extract, beef juice and beef tea are given in the supplement on DIET AND INVALID COOKERY.

BEER.—Apart from its alcohol content, malt liquor contains varying proportions of energy foods, chiefly in the form of carbohydrates. The quantity of protein present is negligible. Beer is usually taken as an appetizer and to quench thirst; but, at all times, it should be taken in moderation. Persons with a tendency to stoutness should not drink beer and malt liquors, for this tendency is liable to become increased. The light lager and pale ales contain the least amount of alcohol; while the old ales and heavy stouts contain the most. For

invalids, only the lighter forms should be used, but never in any great quantity.

Beer is made from malt and hops, but often the brewer substitutes a proportion of raw grain, cane sugar and glucose. A good beer should be clear and reddish-brown in tint, and should not be soured.

BEESWAX.—Beeswax is the yellow wax (cera flava) produced by bees and used by them to make the cells in their combs, in which they will later on store the honey they gather. This yellow wax is used a great deal in medicine for making up ointments and plasters. White beeswax (cera alba) is just the ordinary yellow beeswax bleached white. Ointments made of beeswax with the addition of other substances such as oils or resins are sometimes called *cerata.*

BELLADONNA.—This powerful drug is obtained from the belladonna plant, which is more popularly known as the deadly nightshade and is a well-known inhabitant of our hedges and woods. It can be readily recognized by its clusters of small purple flowers with orange centres, rather like lilac in appearance, which climbs about amongst a tangle of other plants in the hedges. Later on the flowers turn into bunches of bright scarlet berries and as they ripen about the same time as the blackberries and often grow amongst them, a summer never passes without some children being poisoned by eating them in mistake.

Belladonna is one of the most useful drugs we have, and atropine—the alkaloid which comes from the same plant—is also of the greatest use. Its chief use is in treating diseases where there are painful "spasms." A spasm is a tightening of the muscles in any part of the body so that that part cannot continue its work and the tightened muscles cause great pain. Such spasms occur in a large variety of diseases such as asthma, bronchitis, stomach troubles, gall-stones, inflammation of the bladder. Belladonna or atropine will usually cause the muscles to relax, thus relieving the spasm. It cannot be taken for more than a few weeks at a time, however, or the effect will wear off and the patient may have too much in the system and be poisoned. Children can usually take it for a longer time than grown-ups without harmful effects, and it is sometimes prescribed for troublesome cases of bed-wetting. in whooping cough it is of the greatest use, and will often be successful where other remedies fail.

Belladonna plasters are still very comforting remedies in lumbago, phlebitis and painful rheumatic conditions, or in cases where the liver is congested and painful. It used to be thought that a belladonna plaster applied to the breast of a nursing mother would stop the flow of milk, but now it is considered that it is the pressure that affects the flow and that a tight bandage will do as well.

Belladonna liniment is useful to rub in in order to ease the pain of such conditions as rheumatism and neuralgia and lumbago. Care must be taken, however, that poisoning is not caused by too much being absorbed through the skin, as sometimes happens.

Poisoning by Belladonna.—If the berries have been eaten or too much of the drug taken and there is poisoning, an emetic should be given at once and after the vomiting has stopped large drinks of water with sal volatile or alcohol as a stimulant. Artificial respiration may have to be performed if the breathing becomes very feeble.

The symptoms of belladonna poisoning are great dryness of the mouth and throat, enlarged pupils or dark centres of the eyes, rapid beating of the heart, sickness, excitement and delirium with great bodily weakness.

BELL'S PALSY.—This is paralysis of the facial nerve. It is called after a famous Scottish physician, Sir Charles Bell, 1774–1842. It is described under the heading FACIAL PARALYSIS.

BELT.—*See* ABDOMINAL BELT; CORSETS.

BENGER'S FOOD.—This is a food in which the process of digestion is begun before the patient swallows it. For this reason it is very suitable for infants who find it difficult to digest cow's milk; it is also a very useful food for persons suffering from severe illness or stomach conditions such as gastric ulcer, where no solid food can be taken. The food being partly digested before it is taken into the stomach by the patient, the stomach is thus relieved of much of its work. Full directions for making it are given on each tin and these should be carefully followed in order to obtain the fullest benefit from the food.

BENIGN.—This term is applied to certain tumours which are not dangerous to life and

health. If tumours are dangerous to life they are called "malignant." Benign tumours may grow for years and cause no harm to the patient, but in some cases they have to be removed surgically when they have grown so large that they interfere with the working of other parts of the body. The term benign is also used in connection with the milder forms of malaria.

BENZOIC ACID.—Obtained from the gum benzoin. Benzoic acid is a powerful antiseptic, and lint soaked in a preparation of it is a very favourite dressing for wounds and sores of all sorts. Benzoated lard is a common basis for ointments. Benzoin, benzoic acid and its compounds are very often used in the treatment of bronchitis. The steam from a mixture of a pint of water and a spoonful of compound tincture of benzoin is found beneficial if inhaled in cases of bronchitis and sore throat. It is also given in cases of chronic inflammation of the bladder and rheumatism. (*See also* BALSAM.)

BENZOIN.—A balsamic resin obtained from the stem of Styrax benzoin, a plant found in Siam and Sumatra, that from the former place being the better. The action of benzoin and benzoic acid is the same. (*See also* BALSAM.)

BENZOL.—Benzol or benzene is a light colourless fluid obtained from coal-tar oil. It has a very strong characteristic odour. Applied externally, one liberal application will destroy lice. Benzol has been given internally in the treatment of whooping-cough. It is a highly inflammable substance and should never be used near a naked light. In cases of poisoning by benzol, an emetic should be given followed by stimulants.

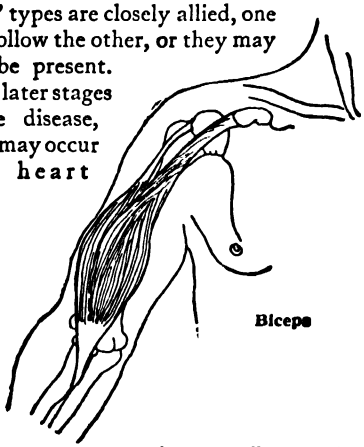
BERGONIÉ TREATMENT OF OBESITY.—One of the most effective treatments for fatness or obesity, as it is called, is by means of the special chair invented by the French physician, after whom it is called. The patient reclines in this specially built chair, which is attached to a battery of faradic electricity. For an explanation of the technical terms such as "faradic," "electrode," etc., read the article on ELECTRICITY IN MEDICINE given further on. For the purposes of simplicity, it may be explained here that an electrode is the means by which the patient is connected with the electric current. In the Bergonié chair, the back and seat of the chair itself act as electrodes for the parts of the body they come in contact with, and additional electrodes are applied to the abdomen, the forearms and legs until nearly all the surface of the body is covered, and thus brought into contact with the electricity. The electric currents are carefully regulated so that there will be no painful stimulation.

The Bergonié treatment is specially useful for cases where the muscles have become weak, and where the patient is, for some reason such as a diseased heart, unable to take enough exercise. In order to obtain exercise for the debilitated muscles without fatiguing the heart, the patient is connected up with weak electricity all over the body in the manner described above, sandbags are placed over the electrodes, and the electricity is turned on. All the muscles of the body are stimulated and forced to contract painlessly and rhythmically; thus the patient obtains general exercise of the muscles without strain or the using up of nervous energy. As much as a pound may be lost in weight at one sitting, and the loss is likely to be permanent. The patient improves in general health and feels buoyant and exhilarated. If it is not desired to exercise the whole body, any given part can be exercised by simply changing the position of the electrodes and sandbags. The sandbags serve to keep the electrodes in place and also to give the muscles more work to do by forcing them to push against their weight.

BERI-BERI.—Beri-beri is a disease caused by the absence from the diet of vitamin B1 (which is described in the article on VITAMINS) and is therefore known as a "deficiency" disease. The disease is usually found in countries where rice is the chief article of food (Japan, China, India, Malay Peninsula). It is due to the eating of rice which has been polished in order to remove the husk. The vitamin is in the husk. This vitamin is found in various other foods, such as eggs, vegetables, cereals, pulses, meat and milk, and although the disease is more common in rice-eating countries, it has been known to break out in ships, jails, and institutions, wherever the diet has a deficiency in this vitamin.

Symptoms usually begin to develop after there has been a shortage of vitamin B1 for about three months. There are two main types of beri-beri: "dry" and "wet." In

the "dry" type, there is much weakness and wasting of the leg muscles, loss of feeling in various parts of the skin, and pain in the limbs and joints. Tender swellings may appear in the calf of the leg, and the skin may feel dry. In the "wet" variety, there may be acute dropsy commencing in the legs and spreading upwards to the belly and lungs. The heart is usually affected and becomes very much enlarged, also the veins become too full and there is enlargement of the liver. The temperature remains normal and the mind remains quite clear. There are various degrees of the disease, but it usually gets steadily worse unless the diet is corrected by taking more eggs, milk, vegetables, meat, etc. The "wet" and the "dry" types are closely allied, one may follow the other, or they may both be present. In the later stages of the disease, death may occur from heart failure, but recovery is generally certain if the proper treatment is carried out.



Biceps

Treatment consists of an ordinary mixed diet with the addition of the substances which contain vitamin B1. This can be quickly supplied in the form of yeast, Marmite, rice husks, wholemeal bread and milk. If the disease has become serious the patient must be kept in bed. Bleeding may be carried out to give relief in cases where the veins have become swollen, and massage may be useful for the legs. Heart stimulants do not have much effect since the main treatment lies in correcting the diet.

BETEL.—A few grains of the nut are rolled up with a small amount of quicklime in a leaf, and chewed. This practice is very common in the East. (*See also* Areca.)

BEVERAGES.—By the word beverage is meant anything that is used for drinking purposes. Milk, cocoa, gruel, etc., are nourishing beverages. Ginger ale, lemonade and so forth are refreshing aromatic beverages. Tea, coffee, are the chief stimulating beverages. Other beverages soothe, like black-currant tea. For a full account of the various beverages, see the supplement on Diet and Invalid Feeding.

BEZOAR.—Bezoar or Zoa stones were stones formed in the intestines of goats and other animals in the same way that stones form in the kidneys, the bladder and gall-bladder in the human body. These bezoar stones were brought in the Middle Ages from Zoa in Africa, hence the name, and were supposed to be a remedy against poisoning.

BICARBONATE OF SODA.—A white powder, which is alkaline, used in the treatment of acid dyspepsia, for nasal douches, and for soothing irritable skin troubles. (*See also* Sodium.)

BICEPS.—Biceps, which means two-headed, is commonly used to denote the well-known muscle in the upper arm, but is also the name of another muscle in the upper leg. The two muscles are alike in that they each begin in two different places and join together to form one muscle, thus earning their name. The biceps in the arm is the muscle responsible for bending the forearm on the upper arm and is thus used in weight-lifting. It comes into play in most athletic pursuits such as rowing, boxing and swimming. The biceps in the leg is a muscle at the back of the thigh.

BIDET.—A bidet is a small hip bath used for administering douches and enemas. It may be raised on legs and be fixed in a special chair.

BILE.—Bile or gall is the substance which is produced by the liver. It plays an important part in the process of the digestion of food. In appearance bile is a slightly sticky fluid, varying in colour from deep golden yellow to greenish yellow, according to whether it is collected from the liver itself or from the gall-bladder, and how concentrated it is. It has a very bitter taste and is composed of a mixture of substances known as *mucin* and *cholesterol*, together with certain salts and two colouring matters, one of which is green and the other is red. These colouring agents are formed from the dead blood-cells which it is part of the work of the liver to break up and get rid of out of the body. The liver also abstracts certain

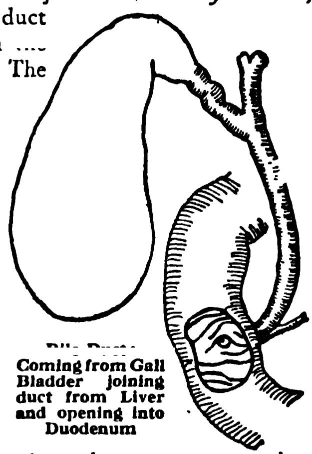
poisons, or toxins as they are called, from the blood for the purpose of turning them out of the body by way of the stream of bile which carries them to the intestines. It will be seen, therefore, that if the liver is sluggish and the bile not flowing properly, these poisons get taken back into the system and cause the toxic state known as "liverishness" or "biliousness." Calomel and Epsom salts are the two remedies which are specially useful in increasing the flow of bile and relieving this state of sluggishness.

The yellow substance called cholesterol is the chief ingredient of gall-stones when they are present in the gall-bladder. The bile, besides being the means by which the body rids itself of waste materials from the tissues, is also an important factor in the process of digestion. With the aid of the juice from the pancreas or sweetbread, which it meets in the duodenum, it plays a part in the digestion of fats. Its salts also have a strong antiseptic action and help to prevent too rapid decay of materials in the intestines before they can be got rid of.

The amount of bile produced varies from one to two pints a day. A large part of the bile flows directly from the liver into the tube called the common bile duct and from there into the duodenum. Some trickles slowly into the gall-bladder where it is stored and concentrated. From the gall-bladder it enters the common bile duct and flows from thence to the duodenum. The duodenum is the passage between the stomach and the intestines. It works by means of a valve at each end, and the entrance of food into the duodenum from the stomach is the signal for the bile to flow out of the common bile duct in greatly increased amounts. Active bodily exercise increases the flow of bile and will often relieve liverishness at once. Alkalies such as bicarbonate of soda in large doses are given in order to make the bile more liquid and enable it to flow more easily. Drugs which increase the flow or manufacture of bile are known as *cholagogues*. Salicylate of soda and aloes are useful in this respect.

Indirect cholagogues which act by hastening the passage of the bile through the duodenum and thus preventing waste matter from having time to get back into the blood, are calomel, magnesium sulphate, podophyllin, etc. The action of olive-oil on the bile is being studied nowadays. It undoubtedly has a beneficial action in some cases of gall-bladder disease, but it is doubtful whether there is any foundation for the claim made that its action will cause gall-stones to melt away. It is more probable that by hastening the flow of the bile it drains the gall-bladder, and thus disposes more quickly of the evil results of a too rich meal or of over indulgence in alcohol.

BILE DUCTS.—The fluid produced in the liver is called bile. It is collected in numerous small vessels in the liver, called the bile-capillaries, and flows into two large ducts or tubes called the right and left *hepatic ducts*. These two ducts join together to form the *hepatic duct*, and about ⅞-in. farther on the hepatic duct is joined by the *cystic duct*, which is the duct leading from .... gall-bladder. The joint hepatic ducts and cystic duct form the *common bile duct*, and as such carry the bile into the duodenum which they enter, together with the first part of the bowel duct, from the pancreas at a point about 4 in. below the lower opening of the stomach.



Bile Ducts
Coming from Gall Bladder joining duct from Liver and opening into Duodenum

As these ducts are narrow tubes less than a ¼-in. wide, it will be seen that they can be easily blocked by stones from the gall-bladder or by bands and adhesions outside, in which case the gall-bladder may become over-full and distended and the patient suffers from stomach troubles as a result of the insufficient supply of bile to the intestine.

BILHARZIASIS or LIVER-FLUKE DISEASE.—Bilharziasis is a disease not found in England, but which is very common in Africa, especially Egypt, the West Indies, South America, China and Japan. It is caused by the entrance into the body of certain parasites known as fluke-worms. There are three types of these worms which invade man and they seek different parts of the body. One prefers the urinary system, one

the large intestine or bowel and sometimes the bladder, while the other is never found anywhere except in the large intestine. They all behave, however, in the same way. Human beings become infected by the young swimming forms of fluke-worm which swim about in water and pierce their way through the skin of people who are paddling or bathing in the water in which they are swarming, or the infection may be picked up in the drinking water. The young worms pass into the veins of the person they attack and in about six weeks develop into full-grown worms. When they are full grown they find their way into the liver, hence their common name of liver-flukes, and there they pair and find their way to the bladder and large intestine, where they deposit their eggs. The eggs pass through the bowel and are passed out into the outside world in the urine and the stools. They hatch and start life as young fluke-worms in some other person or animal.

Symptoms.—The first stage of the disease begins by a pricking and smarting sensation and redness at the spot where the worm has forced its way into the skin. This sensation usually wears off in a day or two, and nothing more is noticed until about a month or later when symptoms of toxic poisoning begin to appear, such as headache, chilliness, pains in the belly, skin rashes, and swellings of the face, trunk, limbs, private parts etc., appear. The eggs may not be deposited in the urine until anything from two months to two years after the infection has been received. At that time blood begins to appear in the water, and signs of severe bladder and intestinal trouble are observed. In the early stages of the disease the general health does not suffer much, but loss of blood at a later stage brings on a state of anæmia and ill-health. Persons living in infected areas who have been infected usually become safe from further attacks, if they do not and are being constantly re-infected their condition will become very bad and they may even succumb to the disease.

Treatment.—Bilharziasis is best treated by injections into the veins of antimony tartrate. It can usually be cured by this treatment unless there are very severe complications. (*See also* WORMS.)

BILIARY COLIC.—Biliary colic is the intense pain caused by the contractions of the bile ducts in their effort to expel a stone or gravel which has entered the duct and is blocking it. The onset of the pain is usually very sudden and it is so severe that it is usually described as "excruciating." It is felt sometimes round and above the navel and sometimes all over the abdomen and it may shoot up to the right shoulder region. A pain at the point of the right shoulder is often described but in practice the pain is generally not so localized. It comes on in sharp paroxysms and the patient rolls about in agony and doubles up to obtain relief. There may be vomiting and sweating.

Treatment.—During the attack morphia must be given to ease the pain, and if this is not successful, it may be necessary to give whiffs of chloroform. In less severe attacks a hot bath and tincture of belladonna or atropine given by the mouth may be sufficient. After the pain has been dealt with the condition which caused it must be attended to.

BILIOUSNESS.—The word biliousness is popularly applied to states where there is a feeling of nausea or an inclination to sickness, dirty tongue, headache, discomfort in the stomach and constipation. The term "liverish" is also used. Strictly speaking this state has nothing to do with the bile itself except in so far as the fact that the liver is not working very well may cause the system to be overloaded with toxins which it is the liver's job to remove from the blood. In children an attack of "biliousness" follows very often after eating too much rich food at a party. This type of bilious attack is really acute gastritis or upset of the stomach and is easily dealt with by a couple of days on starvation diet and some simple alkaline medicine such as magnesia. Should the condition continue, however, or return from time to time, especially in middle-aged or older people, a thorough overhaul by the family doctor or at hospital should be arranged for, as it may be the beginning of more serious trouble.

BINDERS.—After her confinement it is usual for a woman to wear a binder round the abdomen for a week or more until the muscles of the abdominal wall have regained their elasticity and tone. This binder is made of strong linen and is 12–16 inches in breadth and wide enough to fold well over the abdomen. It is better not to hem the edges as they may press into the delicate skin of the abdomen and cause discomfort.

A similar binder in narrower flannel is

wrapped round the abdomen of the new-born baby until the cord has dropped off and the navel is quite healed. (*See also* BABY; CHILDBIRTH; CLOTHES.)

BINET-SIMON TEST FOR INTELLIGENCE.—This is a test used to gain an idea of the level of intelligence of a person. It is necessary sometimes to use some test of intelligence in the case of backward children in order to find out whether they are only backward or are really incapable of being taught at a general school amongst normal children. (*See also* INTELLIGENCE, TESTS FOR.)

BINOCULAR.—This means the ability to use both eyes at once. Each eye has its own power of vision, which is obvious if one closes one eye at a time and looks at an object. The object will be seen by each eye separately, but by using the two eyes together, the object will appear much clearer. (*See also* EYES; VISION.)

BIOCHEMISTRY.—Biochemistry is the name for the science dealing with the chemistry of the body. It is physiological chemistry, or the chemistry of living tissues and organs, and is a science in which a great deal of research work is now being done. Discoveries such as insulin come into the sphere of the bio-chemist.

BIOLOGY.—This term is applied to the science of life and living things. The structure and function of all living things are studied in this science so that it forms a very wide field of medical knowledge.

BIPP.—This is a preparation of bismuth, iodoform, and paraffin which was used extensively during the Great War as a dressing for wounds. Wounds of all sorts did very well with this treatment, but to-day it is used chiefly in treating abscesses in bone, such as mastoid abscess. (*See also* BISMUTH.)

BIRTH.—The birth of a child normally takes place nine months after the date at which the mother had her last menstrual period or "courses." If the child arrives after only seven months it is said to be *premature*. It may still live and in time become strong, but will require very careful attention in its early years. Birth earlier than six and a half months but later than three months, is called a *miscarriage*. Before three months it is an *abortion*. The birth of all babies born after twenty-eight weeks of pregnancy, whether alive or dead, must be notified to the Medical Officer of Health of the district within thirty-six hours. This must be done by the father or any person in attendance on the mother at the time of the birth. In addition the birth must be registered with the Registrar of Births, Marriages and Deaths. It is a criminal offence to conceal a birth. A *stillborn* child is one that is born dead. (*See also* CHILDBIRTH; LABOUR; PREGNANCY.)

BIRTHMARKS.—Birthmarks or nævi (which is the plural of the word nævus, meaning present at birth) are blemishes on the skin which are present at birth. They are of many different sorts and the term should, strictly speaking, include moles and warts as well. In general, however, when we talk of birthmarks we mean the red or purplish stains or swellings on the skin with which some children are born, and which do not fade away in the first few weeks of life but remain stationary or in many cases grow larger as the child grows.

A birthmark is really a tumour of the very tiny blood-vessels of the skin. In one area on the skin these tiny blood-vessels, or capillaries as they are called, are swollen and overgrown, and there may be here and there amongst them a dilated larger vein or artery. The whole mass of these dilated blood-vessels stands out sharply from the rest of the surrounding skin and is seen as a dark-red stain on the skin. Little is known about their origin, though some authorities suggest that they are due to pressure exerted before birth by the bones of the mother where the baby is lying against them. Some families seem to be much more liable to have them than others, and a birthmark in the same spot and of the same shape has been known to occur in successive generations of one family. It is a very common superstition that if a woman is scared by some such small animal as a mouse or beetle while she is carrying a child, the child may have a birthmark the shape of the animal in some prominent place. There is no foundation for this theory at all, and it has almost certainly arisen in the past because of the resemblance that many birthmarks do bear to small animals and insects. A case is known to the writer where an easily recognized beetle has appeared between the shoulder-blades of females in two generations, but it is not likely that two mothers in the same family were scared by beetles while they happened to be with child. The danger of these old superstitions is just that the nerves

of a young woman who is expecting a child are not at their best anyway, and if she happens to be startled by a mouse scuttling across her path and is told that such shocks cause birthmarks in unborn children, she may spend much time brooding over the incident and reduce herself to a nervous wreck.

To return to a description of birthmarks. The two most usual sorts are the "spider" and the "port-wine stain." In the case of the spider or arachnoid nævus, the dilated blood-vessels spread out from a centre with a spider's-web appearance. These birthmarks may be very small or may grow to a large size. The port-wine stain is the birthmark most commonly found on the face. It is called port-wine stain from its dark purple colour, and it is unfortunately very disfiguring. In some cases the whole of one cheek may be covered, or the stain may be no larger than the size of a small coin. Often moles are present as well and there may be a heavy growth of hair to add to the disfigurement.

Treatment.—In the treatment of all varieties of birthmark the chief aim is to remove the birthmark with as little scarring as possible. This is naturally a difficult task. Of course if the birthmarks are of some size on the covered parts of the body, where the presence of a scar does not matter, and removal is desired, by far the most useful method of treating such cases is that of removal by surgery. A single operation is sufficient, and the cure is speedy and certain. Skin may be brought from another part of the body and be grafted on if necessary.

"Spider" nævi are treated by applying an electric needle to the central point, or by using a cauterizing needle. Birthmarks are also treated by freezing with carbon dioxide snow (liquid air), or by burning with a caustic such as acid nitrate of mercury, nitric acid, or carbolic acid; but in the latter case the treatment is found to be not altogether satisfactory, as traces of the tumour frequently remain, and a new growth may appear. If advised, treatment by radium is very good, as it does not disturb the patient at all and it is especially good for young children, which cannot be said of the other methods. It is also better for birthmarks about the size of a shilling or larger, as these are difficult to destroy by the cautery.

The very extensive "port-wine stains" are so difficult to treat satisfactorily that many authorities advise leaving them alone entirely. The blood-vessels of this type are, unlike the other varieties, embedded in firm, solid tissue, and cannot be destroyed without running the risk of damaging the surrounding tissues as well. As these birthmarks on the face cause a great deal of mental suffering to their unfortunate possessors, expert advice should be sought at an early stage, and one or other of the treatments mentioned above may be tried. If an adult with a large port-wine mark is anxious for treatment, several small areas may be treated at each sitting and the mark gradually reduced, or at least, made paler. It is however, a process that may literally take years to complete, so that none but the most persevering should be encouraged to try it.

BISMUTH.—Bismuth and its preparations are included in the class of heavy metals used in medicine. Used externally, salts of bismuth may be dusted on sores and wounds as a protective and mild drying agent, but the antiseptic action is very slight. A bismuth, iodoform, and paraffin preparation which is more popularly known as B.I.P.P. or "Bipp," invented by Professor Rutherford Morrison, of Newcastle, was used with excellent results during the Great War in the treatment of wounds, and is still used, chiefly in infections of bone. One form of bismuth may be used for X-ray diagnosis of conditions of the throat and stomach, but latterly barium meals have been used instead of bismuth meals for this purpose.

In the treatment of stomach ulcers, either gastric or duodenal, bismuth mixtures are greatly used in combination with alkalies such as magnesium carbonate. In cases of diarrhœa large doses can be given without any ill effects. In cases of dyspepsia, nausea, vomiting or diarrhœa, the following prescription will help to relieve discomfort:

Bismuth carbonate	.	30 grains
Magnesium carbonate	.	20 „
Sodium bicarbonate	.	30 „

The powder should be taken in a little milk about twenty minutes before meals whenever an attack of dyspepsia is threatened.

A preparation of finely-powdered bismuth salts may be used as a snuff for the relief of nasal catarrh. In the treatment of syphilis,

injections of bismuth salicylate into the muscular tissues have proved very effective.

Poisoning by bismuth may occur as a result of over-dosage; but, as a rule, any symptoms of stomach or intestinal irritation caused by bismuth are due to the arsenic with which bismuth salts, especially the subnitrate, may be contaminated. Poisoning symptoms include swelling of the gums and soft palate, with a characteristic black line along the gums at the roots of the teeth. All bismuth dressings should be removed from the patient as soon as signs of poisoning appear, and no bismuth should be given internally. Owing to chemical changes which take place, bismuth is black when it leaves the bowel. In this way, the stools of a patient who has been taking bismuth, may have a grey-black appearance, but this fact need cause no alarm as it is merely due to the chemical change explained above.

BITES AND STINGS. Insect Bites.—It is sometimes difficult to distinguish between a rash and a crop of insect bites, when a child or person has been badly bitten without the insect being seen that did the damage. An insect bite has always a small red puncture in the middle of each spot where the sting of the insect broke through the skin, and the spots due to a rash have no such central point. Unless one is looking for insect bites, however, it is quite easy to overlook this central puncture and it is not uncommon for a baby to be covered with what its mother calls "teething rash," which if more closely looked at would be seen to be a fine crop of flea or other bites!

The insects which most often bite human beings are fleas, bed-bugs, lice, mosquitoes, harvest-bugs, sand-flies (also called jigger) and wood-ticks. Ticks generally remain under the skin at the point where they made the wound; so do sand-flies.

Treatment.—Insect bites are always very itchy, and dilute ammonia water, or a strong solution of bicarbonate of soda or baking-powder, dabbed on to the bites at intervals or bound over them on a pad of cotton-wool will ease the irritation. The common blue-bag which is to be found in most kitchens and wash-houses is also useful. It should be wet and held over the spot. An onion may be rubbed on. These are easily obtained domestic remedies, but they are often as useful as the more expensive preparations sold for the purpose in shops. If the skin is very much irritated however, simple calamine lotion may be spread on and allowed to dry on the skin.

Sand-flies and ticks must be killed before they are removed. Kerosene, turpentine or tobacco juice, which is the most likely thing to be handy, will all kill the insects if the wound is bathed in them. The dead insects must then be picked out with a blunt needle which has been put into a flame for a moment to sterilize it, and afterwards calamine lotion may be put on.

Dog Bites, etc.—Mad dogs, fortunately, are rare in England nowadays, so that unless there is any evidence to the contrary, a dog bite should be treated as an ordinary torn wound. That is to say, wash the wound thoroughly, pour in some iodine or methylated spirits, and apply a dressing of clean lint. The bites of other large animals should be treated in the same way as those of dogs. A cat more often scratches than bites, but cat bites are not unknown. A pig can give a very nasty bite, and any other animal is liable to snap at a human being, especially if it is alarmed, or if it is accompanied by its young.

But if there is any reason for suspecting that the dog was mad, there is a danger of hydrophobia and prompt treatment is of the utmost importance. The poison in this case comes from the dog's saliva and passes rapidly from the wound into the system of the bitten person.

Treatment.—Emergency treatment must be given with the object of removing as much as possible of the poison from the wound, and of stopping it from getting into the bloodstream.

Snake or Poisonous Adder Bites.—The poison in these cases acts quickly, so immediately suck the bite hard, spitting out at once and being careful not to swallow any of the matter sucked out. Apply a tight bandage above the wound and try to make the wound bleed freely, opening it with a knife if necessary. Hold it under a tap if there happens to be one handy. If any crystals of potassium permanganate are available, rub a few well into the wound, otherwise use iodine or methylated spirits freely. Give the bitten person stimulants and get him to the doctor as soon as possible.

Wasp and Bee Stings.—Wasp and bee stings are extremely painful and happen to

everybody sometime during their life. A bee which has once stung becomes harmless because it leaves its sting in the wound and cannot sting again; but a wasp keeps its sting and may return to the attack again and again. If the sting has been caused by a bee, therefore, the first thing to do is to find the sting and gently pull it out. Rub the area with a blue-bag, dab on dilute ammonia, methylated spirits, iodine, or whisky, or any specially prepared remedy for insect bites. If the bitten person is suffering from shock, make him lie down, loosen his clothing, but keep him warm. Give stimulants such as whisky or brandy, or sal volatile in water, and if necessary send for the doctor. If a person gets stung by a bee, wasp or mosquito about the mouth or throat or on the upper lip, he must be taken at once to a doctor or hospital as stings on these parts swell very rapidly and may have fatal results. It sometimes happens that there is a wasp or bee in a piece of fruit or other food that a person puts in his mouth. If he is stung like that, it is not a matter to treat lightly, as the bite may easily have fatal results if not attended to at once.

Other Stings.—Under this title are included those domestic accidents caused by jellyfish, hairy caterpillars, and nettles, and commonly spoken of as "stings."

Jellyfish (some varieties only) cause an itchy red rash at the site of contact, by the discharge of small threads which are intensely irritating or "poisonous" to the skin. Hairy caterpillars often cause a similar rash through puncturing of the skin by their brittle poisonous hairs. In both cases an application of vinegar or olive oil relieves the condition.

Nettles "sting" because their hairs, when broken by contact, discharge formic acid into the skin. They are therefore relieved by a mild alkaline solution, such as dock leaves moistened by the saliva, or the blue-bag. Most children know, that by a merciful act of Nature, dock leaves always grow where nettles are found, and when stung they run of their own accord to rub on a dock leaf.

BITTER ALMOND POISONING.—*See* ALMOND; PRUSSIC ACID.

BITTERS.—In medical language the group of "bitters" contains substances which possess the common property of very bitter taste. These bitter drugs are usually given to increase the appetite and thus aid the digestion. In popular language the word bitters usually means alcoholic beverages which contain bitter or aromatic substances.

A few of the bitters used in medicine include calumba, gentian, quassia, cascarilla, serpentary, and orange peel. These all act very similarly. Calumba and quassia are known as simple bitters. Another group of bitters contains an oil in addition to the bitter substance; orange peel is the most popular of this group. Powerful drugs such as quinine and strychnine, although they do not come under the "bitters" group, may be used in medicine only for their bitter taste.

The action of bitters is to stimulate and increase the amount of digestive fluid produced by the salivary glands and also by the stomach. This greatly increases the appetite and aids the digestion of food. Bitters should never be used by persons who suffer from gastric ulcer or any form of inflammation of the stomach. In cases where dyspepsia is due to a general weakness of all the organs of the body, such as occurs in anæmia, starvation, tuberculosis, and convalescence from acute diseases, calumba is especially valuable in stimulating the working of the digestion and thereby improving the appetite.

Bitters must not be given in too strong a form, nor be given for too long, as they are likely to over-irritate the stomach. (*See also* APPETITE; DIGESTION.)

BLACK DEATH.—This awesome term used to be applied to the plague which at one time was the scourge of Europe. In 1664–1665 the greatest epidemic occurred in London. Modern methods of sanitation and public health have now been the means of checking epidemics, and although isolated cases may occur, prompt measures are taken to prevent the spread of the disease. (*See also* PLAGUE; EPIDEMICS.)

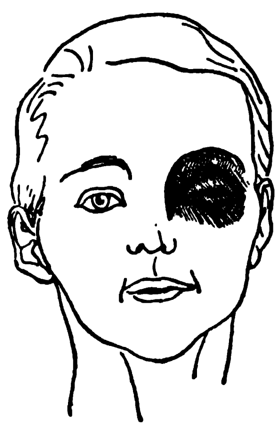
BLACK DRAUGHT.—This is a compound mixture of magnesium sulphate, liquid extract of liquorice, and an infusion of senna. It is used as a purgative in doses of 1 to 2 tablespoonsful.

BLACK EYE.—A black eye is generally the result of a bruise in the neighbourhood of the eye, often caused by a direct blow on the eye. The condition is too well known to need description. Owing to the fact that the skin of the eyelids and that about the eyes is very

loose, blood is able to gather very easily under the eye, so the bruise may often look as if the blow had been much more violent than it was. A curious effect is sometimes seen when some of the blood flows under the conjunctiva (the thin membrane covering the eye); this may remain bright red, while the blood in the eyelids is nearly black.

After operations on the nose and the hollow cavities round the nose, there are very often black eyes caused by blood which has come from the point of the operation. This disappears in a few days of its own accord.

Treatment.—If the black eye is seen immediately after the blow has been struck, cold wet cloths should be applied to the eye, or pads of cotton-wool wet with lead lotion. This will do as well as the slab of raw beef-steak, which is still used sometimes, and is cheaper too. Later on, when the "black eye" has become quite evident, hot compresses may be used, also gentle pressure and massage with pure olive oil. If the eye continues to be painful, however, this should be discontinued and an oculist should be consulted, as there may be some other injury to the eye itself.



Black Eye

The discoloration may be concealed during the day by means of a flesh-coloured (water-colour) paint, which is quite harmless to the skin, or by a little theatrical grease-paint.

BLACKHEAD.—A blackhead is a dark plug about the size of a pinhead, which appears in the sweat glands in the skin. They are found usually on the face, back of the neck, chest, and back, and are a symptom of acne. They are found, as a rule, in young people. (*See also* ACNE VULGARIS.)

BLACK MOTIONS.—Dark coloured, almost black motions, are passed sometimes when there is great constipation and the stools have been delayed for several days in the bowel. Iron and bismuth taken as medicines make the stools black. The most usual cause, however, in cases where these drugs are not being taken, is the presence of blood in the stool, due to ulceration of the stomach or bowel. This condition is serious and is known as *melæna.* (*See also* MELÆNA.)

BLACK VOMIT.—Black or dark-coloured vomit is usually due to the presence of blood in the stomach when there is an ulcer. It is vomited up as a dark sediment, usually described as resembling coffee grounds. (*See also* STOMACH, ULCER OF.)

BLACK WASH.—This is a black lotion made up of calomel, glycerine and lime water. It may be used to relieve the itching of skin diseases, if they are not too extensive. It is also used as a wash for syphilitic sores.

BLACKWATER FEVER.—This disease is a complication of malaria. Its chief symptom is *hæmoglobinuria* or the presence of hæmoglobin—the colouring matter of the red blood cells—in the urine. The disease is especially prevalent in Africa, certain parts of Spain, Italy, Greece, Russia, the Near East and Palestine; it is also found in some parts of the United States, South America, the West Indies, and in Asia, India, and the Far East. It is only found in England in patients who have returned after contracting malaria abroad.

The patient is usually a European who has lived in a malarial country for over six months, and, as a rule, there is a history of repeated attacks of malaria which have not been properly treated. It usually comes on very suddenly and may be started by a chill or a dose of quinine, although quinine is not its actual cause.

Symptoms.—These vary greatly in order and severity. Usually there is a feeling of tiredness for a day or two, with loss of appetite, and chilliness. This is followed with dramatic suddenness by severe shivering fits or rigors. There may be severe pains in the back and limbs, with dizziness, weakness, nausea, and the vomiting of bile-stained fluid. The urine is then noticed to be red and there may be a desire to pass water frequently. The skin becomes hot, itchy and dry and may develop a deep yellow tinge, and the spleen and liver generally become enlarged and tender. As the disease progresses the patient may become drowsy and irritable, and delirium and prolonged unconsciousness may set in. Hiccough is a symptom in very

severe cases. The patient at this stage may recover; the temperature, which often rises as high as 103°, may drop after three or four days to normal and remain there. On the other hand, the temperature may remain high and death may follow, owing to suppression of urine and other complications.

Treatment.—Blackwater fever is a disease which should never be treated lightly. There are many mild cases which recover, but the outlook in severe cases is very grave. In order to ward off this disease in districts where blackwater fever is very frequent, every attack of malaria should be actively treated with quinine.

As soon as symptoms of the disease appear, the patient should be put to bed and kept lying down. He should be given fluids containing glucose, and an alkaline mixture to render and keep the urine alkaline. If there is suppression of urine, hot applications such as water bottles, should be applied to the loins. If malarial germs are found in the blood, quinine should be given very cautiously and only under medical supervision.

Convalescence is generally lengthy and slow, and complications are frequent. After recovery it is best for the patient to leave a malarial country, as dangerous relapses are to be feared. (*See also* MALARIA.)

BLADDER.—A reservoir for the waste fluid of the body. It stores up the water and salts passed on by the kidneys until it is convenient to pass them out of the body in the urine. Each kidney is connected with the bladder by a long narrow tube of muscular tissue known as a *ureter*, and the bladder is connected with the exterior by a passage called the *urethra*.

The shape of the bladder varies a great deal according to whether there is little or much fluid inside. It is situated in the lower portion of the bony girdle known as the true pelvis, where it is kept in place by means of rather lax ligaments so that when empty it is so contracted that there is practically no cavity, whereas when filled it expands until it holds from 8–12 ounces of urine. In abnormal conditions it will hold well over 40 ounces.

When the urine has collected in the bladder sufficiently to raise the pressure above a certain point, slow rhythmical contractions take place in the muscle walls. These get stronger and stronger until they become powerful enough to overcome the circular muscle fibres which guard the exit of the bladder into the urethra. The urine is then expelled. This action is known as a "reflex" action, and occurs in the lower animals and in man until it comes under the control of the "Will" which has the power of regulating the reflex mechanism.

The bladder is lined on the inside by mucous membrane which is loosely attached to the muscular coat so that it is thrown into folds when the cavity is small, and smoothed out when it is distended.

Examination of the Bladder by Catheters and Sounds.—A catheter is a hollow tube which is passed along the urethra passage into the bladder to withdraw the urine in cases where the muscle of the bladder is unable to contract sufficiently strongly to force urine out, or where there is some obstruction in the passage itself. Blocking of the passage may be due to the presence of a stone in it, or to enlargement of a gland (prostate) which surrounds the neck of the bladder and the first portion of the urethra.

Cystoscope.—Is a hollow tube with a beak at an angle which carries a small electric lamp at its end. One end has a valve which prevents the escape of fluid from the bladder until required. A telescope fits the interior of the tube and is slipped in after the bladder is washed and distended. The openings of the ureters into the bladder, and whether urine from the kidneys enters the bladder freely can be seen; the quantity and quality of the fluid are also noted. The walls of the bladder can also be inspected.

Diseases of the Bladder.—The bladder is not afflicted with very many diseases, perhaps because it lies buried so deeply in the abdomen and access to it is not very easy for poisons and infections. The commonest disease of the bladder is cystitis or inflammation of the bladder. This will be discussed under its own heading. The two commonest disabilities of the bladder which may be due to disease of the bladder itself or to disease in some other part such as the nervous system which affects the working of the bladder. They are incontinence of urine and retention of urine. These conditions will be discussed below. Besides these the bladder is subject to rupture due to accidental crushing, foreign bodies inserted into it. tumours. stone or

calculus, and such conditions as fistula and diverticula.

Incontinence of Urine.—Incontinence of urine is present when a person is unable to hold back the contents of the bladder until he wishes to evacuate them. The urine may escape in a sudden rush without his having the power to stop it, or it may continually dribble away. In both these cases incontinence is present. In the case where a full flow of urine is suddenly passed without the will of the individual the condition is more likely to be due to trouble in the nervous system than to actual disease in the bladder. This condition is known as *enuresis* and is very well known in its most common form as "bed-wetting" amongst children.

The dribbling away of urine is known as *true incontinence* if the dribbling is from a bladder which is not distended, to distinguish it from *false incontinence* in which the bladder remains full owing to some obstruction such as that due to an enlarged prostate gland pressing on it, and the dribbling is only the overflow which is under such strong pressure that it is able to push its way past the obstruction.

Incontinence due to mechanical causes.—Incontinence due to mechanical causes such as outside pressure on the bladder are more frequent in women than in men. In the latter stages of pregnancy the pressure of the enlarged womb almost always causes a certain amount of dribbling, and some women have the same experience in the last few days of each month just before the period begins; here, again, the swollen womb is the cause. The condition called prolapse which is common amongst women who have had children is also frequently a cause of incontinence. In these cases the incontinence is usually slight and may follow on some sudden exertion. In men this form of incontinence is usually found in connection with an enlarged prostate gland, and is in fact the most obvious symptom of that condition. Even after the enlarged gland has been removed there is often a degree of incontinence for some time, but it will subside. Unfortunately there are many men still suffering from extensive war injuries in the region of the bladder which cause incontinence in some degree or other.

Incontinence due to nervous disease.—The involuntary passage of urine may occur in some diseases of the spinal cord. In the early stages of the disease known as locomotor ataxia there is often a false incontinence, that is, a chronic distension of the bladder with overflowing. It may be first noticed by bed-wetting at night. In the disease called disseminated sclerosis the bladder is small and contracted and the urine is ejected in spurts without the power to control it.

Incontinence due to nerve injuries.—Injuries to the back in which the spinal cord is damaged, such as fractures, dislocations and crushing accidents or gun-shot injuries are usually followed by a period during which the urine is retained in the bladder and only escapes by overflowing. This may last for as long as two months, and may be followed by ordinary incontinence in which the bladder works as it does in a child before the age of control voluntary and it will have to be re-educated until full control returns.

Incontinence in childhood.—Up to the age of a year the infant has not learnt control over his bladder, but before he is two years old he should have gained good mental control over the voiding of urine, except for an occasional lapse due to unusual excitement or some such reason. If the child frequently wets himself or his bed after the age of three years, he must be regarded as abnormal if he has had the usual training from his parents or those who have had care of him.

In most cases of abnormal incontinence in children there will be found some definite source of irritation. Threadworms, a tight foreskin in a boy, or some inflammation round the genital organs or the back passage are common causes of wetting. In some cases enlarged tonsils and adenoids are to blame, probably because of the disturbance to sleep they cause through a feeling of suffocation in the night. In other cases, again, there may be something wrong with the quality of the urine itself. It may be too highly acid and thus hot and burning to pass.

Where no source of irritation can be found and there is no alteration in the urine, and no disease in the bladder itself, the case is known as one of "essential enuresis." In such cases there is often a history of heredity of some form of nervous disease. These cases usually improve gradually. For treatment

of BED-WETTING see the article under that heading.

Retention of Urine.—By retention of urine is meant that a person is unable for some cause to pass urine in the ordinary way. There are many causes for this inability to void water. It may be due to obstruction, such as the increase in size of the prostate gland, or swelling in the region of the bladder due to inflammation, or to some sort of tumour or growth. Any of these will cause obstruction to the flow of urine by pressing on the passage by which the urine escapes from the bladder. Again, there may be an obstruction in the passage or urethra itself, such as a foreign body or a stone. The passage may be ruptured or narrowed by previous disease (stricture) or swollen by acute inflammation. Retention of the urine may be due to lack of tone in the muscle walls, a condition which is generally due to some nervous disease, but in this case there will be other symptoms to show what the disease is. There is retention in many forms of poisoning such as toxic poisoning in such diseases as typhoid fever, appendicitis, syphilis, etc., or due to poisons such as arsenic, mercury, lead, belladonna, etc.

There may also be an inability to pass urine due to spasm of the muscle guarding the exit from the bladder. Here the muscle which is in spasm is holding itself tightly contracted instead of opening and closing as it normally does. This may happen after an operation round the entrance to the bowel or in the region of the bladder itself.

Diverticula.—These are pouches in the wall of the bladder which are lined by mucous membrane. They are usually only discovered when the bladder has been examined by the instrument called the cystoscope, which was described on page 116. The size and position of a diverticulum can be seen by X-ray examination.

Rupture of the Bladder.—This is usually met with in adult males. A *full* bladder is easily ruptured by any form of violence applied to the lower part of the belly, such as a blow, kick, a crush by the wheel of a vehicle, or a fall on a projecting object. In fractures of the pelvis the bladder is often torn or penetrated.

Foreign Bodies.—Objects of all kinds have been found in the bladder. Such articles as hair-pins, pencils, etc., are quite commonly introduced by the patient into the urethral passage. As a result of diseases of the pelvic bones and in parts of the body near the bladder, such objects as pieces of bone may find their way into the bladder.

Cystitis, or inflammation of the lining membrane of the bladder, is due to germs or to the action of irritating solutions. It is known that germs can pass through a healthy bladder without producing any changes in the walls, unless some other factor is also present. The most common of these other factors are pregnancy, stricture, foreign bodies, growths, operations on the bladder, and loss of tone in the muscular walls due to nervous disease. It is very often due to the bacillus coli, a germ which grows normally in the large bowel. The subject of cystitis is fully discussed under that heading.

Tumours of the Bladder.—These usually occur between the ages of 40 and 60. Like all tumours, they are divided into two main classes: simple or innocent tumours and malignant or life-destroying growths. Of the simple tumours the most common is the *papilloma*, which is a growth of the lining membrane of the bladder. It may vary in size from a split pea to that of an orange.

Cancer.—It is rare to find a cancer beginning in the bladder; it has usually spread from a malignant growth in other organs. It may arise first of all in the bladder, but this is much more rare.

Stone or Calculus.—Most of the stones found in the bladder started in the kidney and increased in size after entering the bladder. Some stones, however, start in the bladder as a collection of phosphates resulting from alkaline decomposition of the urine. A stone will also form round a foreign body, such as the end of a broken catheter. The same varieties of stone are met with in the bladder as in the kidney; those composed of uric acid, urates or oxalate of lime all form in the presence of acid urine. Stones of the bladder are usually freely movable, but may be fixed in the opening of the passages leading from the kidneys to the bladder, or from the bladder to the external world, or in "diverticula" in the bladder wall.

Fistula.—Is a communication passage between the interior of the bladder and some other organ. It is usually the result of an injury or disease. Fistulas in the bladder

are of three sorts. First, there is the fistula which sometimes forms after an operation for removal of the prostate, or which may be made intentionally when the passage through the urethra is permanently obstructed and cannot be opened up again. This fistula allows the urine to escape through the skin of the abdominal wall to the outside. Secondly, there may be a fistula between the bladder and some part of the intestines. This is usually due to injury or to inflammation which has led to the rupture of the wall of the bladder. There may be a fistula communicating between the bladder and the vagina in women. This may follow an operation of tearing of the vagina due to some such cause as a pessary, or be due to some large growth. (*See also* URINARY SYSTEM; URETHRA.)

BLAIN.—Blain is a term sometimes applied to a blister or a pimple. The most common type of inflamed blister is chilblain. (*See also* CHILBLAIN.)

BLANCMANGE.—This is a particularly appetizing and nourishing form of food for invalids. Peptonized milk may be added instead of ordinary milk in cases where the digestive organs are not working well. The ingredients consist of half a pint of milk (one gill of cream, if obtainable), one ounce of castor sugar, half an ounce of powdered gelatine, and flavouring to taste. Lightly whip the cream and add the milk, sugar, and flavouring. Dissolve the gelatine in half a tumbler of water and stir in carefully. When cool, pour into a wet mould. When firm, turn out and serve.

BLAND.—This term is generally applied to foods of a mild and soothing nature, such as milk and arrowroot, etc. Invalids are usually given bland substances while they are ill or recovering from a severe illness. (*See also* SUPPLEMENT ON DIET AND INVALID COOKERY.)

BLASTOMYCOSIS.—This is a rare, very chronic disease caused by the yeast fungus, and occurs generally in men who have been concerned with the handling of straw or grain. The skin is usually affected, especially that of the face; the backs of the hands and forearms are the next commonest sites. Sometimes the disease spreads to the blood and thence to the lungs and other internal organs. There are one or more raised-up sores, which may look like warts, and which rapidly become studded with tiny abscesses, which break, ulcerate, and finally heal up and leave a scar.

The outlook of this disease is not altogether favourable. Even if the disease is only in the skin, it is most intractable to treatment; improvement may occur, but a cure is rare. Even after improvement, recurrences are frequent. When the disease spreads through the system, it is fatal.

BLAUD'S PILLS.—These pills are a very useful and popular way of taking iron in anæmic conditions. They leave no bitter taste in the mouth, can be bought anywhere and are easy to swallow. They are an old formula, particularly useful for anæmic persons whose digestion is weak.

BLEACHING POWDER.—*See* CHLORIDE OF LIME.

BLEB.—For a description of blebs and blisters *see* BLISTER.

BLEEDERS.—There are certain unfortunate families where the male members have a peculiar state of the blood which causes them to bleed excessively from the smallest scratch or wound. In popular language these people are called "bleeders," and in medical terms, *hæmophilics*. It has been generally considered that only the men in hæmophilic families were "bleeders," but it seems likely that the women may in some cases bleed more easily than is usual, without their bleeding being definitely uncontrollable as it is in the case of the men. The tendency is, however, carried down in the female line and the sons of a woman from one of these families may be "bleeders." It used to be said that the tendency was only transmitted by the female line, and that only the daughters of bleeders must not marry, but of course this is absurd. There would be no families of bleeders if there had not been a married male "bleeder" somewhere within a few generations, so it may be taken for granted that no member of a hæmophilic family should marry and beget children. This is, perhaps, a little too severe, because the trouble does show a tendency to die out of families. Notable examples of families where there are "bleeders" are certain royal families of Europe who are no longer on their thrones. It was a matter of common knowledge that the little Tsarevitch, the heir to the Russian throne who was killed in 1916, was afflicted in this way and would

almost certainly not have grown to manhood. In another case it seemed likely that the heir to the throne would be passed over for the succession because of this failing. This was not done, however, and the matter is not now of such great importance.

Treatment.—It goes without saying that "bleeders" should be protected in every way possible from anything that might cause bleeding, since once bleeding starts it may be found impossible to stop it. They should not enter dangerous occupations, but should be trained to some such occupation as that of a clerk or shopkeeper. In one case the family doctor was so concerned about the future of a family of hæmophilic boys that he took one into his household and employed him to clean the car, but would not allow him to drive it for fear of an accident. One day the boy broke one of the tiny electric light bulbs in a lamp. A splinter of glass cut his finger and he bled to death, although every known means was tried to stop the bleeding. This is a typical case of what may happen to these people. No teeth should ever be extracted, and of course no surgical operation should be allowed. It sometimes happens that the condition is not very well understood, and the relations will allow a boy to have a tooth pulled out, or some little operation like circumcision or the removal of tonsils be performed, without telling the operator that the child comes from a bleeding family, and the truth is only discovered when it is too late to save the child.

Once the bleeding has started, the usual methods for stopping bleeding must be tried. They are pressure by a tourniquet or tight bandages. The application of bandages wrung out in very hot or very cold water, or the application of adrenalin solution ($\frac{1}{1000}$) on cotton-wool. The patient should be taken to a doctor or hospital at once, as a transfusion of blood from a healthy person may have to be carried out and injections of calcium into the veins.

If a "bleeder" is not lost in childhood and reaches the early twenties, the condition will usually improve, and it is likely that before long science will be able to discover something to cure, or at least assist, this unfortunate class of people along the lines of other diseases, in which there is something missing from the blood. (*See also* HÆMORRHAGE.)

BLEEDING.—All forms of bleeding are described under the title HÆMORRHAGE, and the first-aid treatment of bleeding in the SUPPLEMENT ON FIRST-AID TREATMENT.

BLEEDING or BLOOD-LETTING.—Bleeding a patient is a procedure which is not often resorted to nowadays, except in certain cases of heart and lung disease, when there is more blood in the veins than can conveniently be circulated. In order to carry out this operation, the surgeon would tie a piece of rubber tubing tightly around the patient's arm, about two inches above the elbow, thus preventing the return of venous blood to the heart and causing the veins in the arm to swell up and become prominent. The surgeon then slits the vein and draws away as much blood as may be required. The application of leeches in order to draw off blood is a method which has almost fallen into disuse. In modern medicine other methods of treatment are carried out, which are much less harmful to the patient and which produce the desired effects. (*See also* CUPPING.)

BLENORRHŒA.—This is the term applied to any excessive discharge of mucus or phlegm from a mucous membrane. (*See also* MUCUS; MUCOUS MEMBRANE.)

BLINDNESS.—By blindness is meant a complete, or nearly complete, loss of the power of seeing, and to be blind is one of the worst afflictions from which a human being can suffer. The saddest part of blindness, however, is that the majority of cases could have been prevented if care had been taken at the proper time, since they are due to diseases of the eyes which have been neglected. The causes of blindness are numerous, beginning with the defect of being born blind, and going on to all the various diseases of the eye itself, either local or in the course of some general disease, and finally the cases that are due to accident or injury. (*See also* EYES; VISION.)

Born Blind.—The first cause, that of being born blind, owing to complete absence of the eyes, or to some defect of the eyes, is fortunately very rare, as it is naturally incurable. But it is frequently said that many children are "born blind." This is quite a mistaken idea, and the sooner it is discredited the better for a great number of babies who are condemned to life-long blindness through the ignorance or carelessness

of their mother or attendant. The cause is a disease known as Ophthalmia neonatorum, which is described under OPHTHALMIA; BLINDNESS OF THE NEWLY-BORN, which is due to the child's eyes becoming infected at birth by a discharge from the passages of the mother due to the disease called gonorrhœa. "It has been calculated that this disease accounted for one-third to one-half of all the persons in blind asylums, so destructive of sight it is: but now that it is more vigorously dealt with and is notifiable by doctors and midwives its incidence has been kept down." This was written in 1930. In a general report written recently it is said that "Ophthalmia neonatorum remains the most frequent and the most distressing cause of blindness, seeing that these cases must be regarded as *almost entirely preventable.*"

Diseases of the Eye will be discussed under their various headings. In injuries to the eye, the treatment naturally depends on the extent of the injury. Briefly, the other chief causes of blindness are *trachoma*, *glaucoma*, and *conjunctivitis*. *Syphilis*, both inherited and acquired, is a very important cause, which accounts for nearly one-third of all cases of blindness.

During the last fifty years, the proportion of blind in the community has been slowly but steadily declining. This is due to various causes; improvement in hygiene, both at home and at work, better education, leading those suffering from eye trouble to seek skilled assistance early, and the great decrease of such diseases as smallpox, which, before the days of vaccination, accounted for so many cases of blindness, and still does in some countries, such as Russia. Still, there is room for a good deal of improvement yet. Blindness from infections should not occur; smallpox is entirely preventable (except in a very few individuals); gonorrhœa and syphilis, if treated early and thoroughly, will not affect the eyes. Trachoma, glaucoma, and conjunctivitis, mentioned above, cause blindness which in a great number of cases might be prevented by early treatment.

Education of blind people.—No matter at what age blindness comes on, special education should be begun as early as possible. Too many people are mistakenly "kind" in trying to shield a blind person, especially a child, not only from the risk of accidents, but from all contact with the world. Even quite a small child should be encouraged to help himself in every way, by washing, dressing, and feeding himself, by examining everything with his hands, and by taking regular outdoor exercise, to grow accustomed to his limited existence as early as possible. Many children feel not only safe in their own home, or when taking guided walks, but learn to run and to swim or skate quite readily.

If blindness comes on in later childhood, the child, in a good many cases, is happier at a special school, where he is educated by specially trained teachers, and has, too, the companionship of other blind pupils. An adult who becomes blind, or who is likely to do so from disease, should be encouraged to re-educate himself as soon as possible.

It is not uncommon to find blind children developing bad habits, chiefly the making of extraordinary movements and grimaces. Parents should check this tendency kindly but firmly, as such habits are most difficult to eradicate if once formed, and are highly objectionable both to the family and to outsiders.

The ordinary education of the blind was first started by Valentin Häuy, in 1784, in Paris. At the present time, "Blind Schools" have been established in nearly all the important towns (in Great Britain, at least), and numerous societies started for teaching the blind at home. Various methods have been tried, but the Braille system of raised-up letters for reading is considered the most advantageous. It is very simple to learn to read by this method: writing is also easily learned, so that a blind man can not only read, but can take notes and keep accounts. Books can be printed in small bulk, and at a comparatively low cost. The system is well adapted for musical purposes, and even a Braille typewriter has been invented.

A very large number of trades have been learnt and carried on successfully by blind people. There are, of course, outstanding examples who have done brilliantly in music, or at the university, or have done splendid social work, especially to benefit others similarly afflicted, but these are comparatively rare. Lack of means stands in the way of many blind people receiving more than a training for such work as the coarser kind of handwork, such as basket-

weaving, netting, rug-making, and so on. Many blind people, however, develop an extraordinarily fine sense of touch which helps them in many ways. They are also able to do such things as fine knitting and weaving, and to make artificial flowers. Music offers very good prospects if a blind person has any talent, as piano-tuners, teachers, organists; and as masseurs and so on, many blind people earn a good living.

Tobacco Blindness.—Tobacco blindness is found chiefly among working-men, and is caused either by smoking or chewing tobacco in a quantity of not less than three ounces a week. The symptoms rarely occur before the age of forty, though the person may have smoked for years. The poison was accumulating in the system. Women are as likely to be affected as men when they smoke the same amount of tobacco. Other things that seem to have an influence on the ease with which the tobacco affects the sight are the age of the smoker, sleeplessness, prolonged anxiety, the over-use of alcohol, and general weakness from any cause. Some people also seem to be more easily upset by tobacco than others; that is, they are more susceptible to the effects of tobacco. Smoking on an empty stomach is blamed for some cases.

This disease very rarely goes on to complete blindness. It occurs always in both eyes. The patient complains that objects are imperfectly seen; they are "misty"; and that he "can see better in the dark." These symptoms are due to the fact that light-, colour- and form-sense are all diminished; the patient can read easily for some time after he fails to recognize faces, which are less differentiated in light and shade than the black-and-white of printed paper. There is colour-blindness for red and green. No pain is felt unless there are other conditions of ill-health: the patient feels quite well. It is remarkable that he frequently puts off consulting a specialist until only a very little of his normal vision remains.

The diagnosis of tobacco "blindness" is generally easy, not only by the history, but by finding that the eyes are equally affected as regards vision, and by the absence of definite changes in the eyes.

Treatment.—The treatment is obvious—the use of tobacco in any form must be stopped. It will be a month or more before any improvement takes place, but after that, improvement is rapid, unless in very long-standing cases, which may not entirely recover. If diabetes is present, recovery is always slow and imperfect. Strychnine is said to lessen the craving for tobacco. When improvement has begun, iron tonics are useful.

Hysterical Blindness.—Where blindness comes on suddenly for no apparent reason in a person who has shown other signs of being of a hysterical nature, it may be found, too, that the blindness is hysterical. Hysteria of any sort is always a delicate and difficult subject. In the hysterical person blindness may be due to varying causes, mostly associated with nervous shock of some sort. It may be perfectly genuinely impossible for the person to see although there is no real damage to the eye, or on the other hand, the blindness may be "put on," since in hysteria, deceptions are practised which would not be the case if the patient were in perfect health. It is sometimes almost impossible for even the most skilled observer to distinguish between "genuine" hysterical blindness and "pretended" blindness.

Hysterical blindness occurs most commonly in women, in one or both eyes, and the symptoms may be of varying severity and character. The diagnosis of hysterical blindness is usually quite easy, because if the person is watched she is found to be doing things that would be impossible to a blind person.

The treatment is the same as that for other forms of hysteria.

Blinding from Lightning, or Bright Lights, or an Eclipse.—When a person watches an eclipse of the sun without taking the precaution of using dark glasses, the delicate retina of the eye may be damaged. In mild cases, the patient sees for hours or days afterwards a golden disc, or "after-image" of the sun, in front of his eyes; this is most noticeable in the dark. No permanent damage is done to the eye, and the only necessary treatment is confinement to a darkened room for a few days, after which the patient will be perfectly cured.

In more severe cases the patient complains of lessened clearness of the sight, that there is a "blind spot" in the centre of his field of vision, and that objects tremble as if seen

through hot air. In these cases, a change has taken place in the eye itself; on examination, the eye specialist finds a yellowish-white, burnt-looking spot on the retina. Sometimes this is in the shape of a half-moon, exactly like that of the sun at the beginning of an eclipse. In 7–10 days the "blind spot" will have become much less, but some amount of damage to the eye will remain permanently. Some cases have been recorded where, after ten years, the sight was only one-third or one-fifth as good as that of the normal eye.

The ill-effects of *electric light* are seen in electricians who have to adjust strong arc lights. If they incautiously expose the eyes, the first result is "dazzling" of objects looked at, and a dimness of sight, in which everything looks yellowish in colour. In about 6–9 hours, the eyes begin to smart intensely; they feel as if "grit" were in them, and water profusely; the eyelids swell up and become very red, as also does the fine membrane covering the eyeball, called the conjunctiva. The iris is reddened and perhaps inflamed, and this damages the lens of the eye.

The treatment is to apply cold to the eye as soon as the first symptoms come on; this is best done by compresses of ice. When the pain begins, drops of cocaine and atropine are used; the cocaine deadens the pain, and the atropine helps to prevent inflammation in the iris. These cases always recover.

The effects of *lightning* on the eyes are very numerous. Small burns may be caused on the eyelids and the cornea (the transparent membrane in front of the eye); a spasmodic blinking and intolerance of light may result; or drooping of the eyelid from paralysis of the muscle; the eye may be reddened and inflamed, and the cornea, lens, and other clear parts of the eye rendered opaque; the internal structures of the eye may be inflamed or otherwise damaged; worse still, the optic nerve may be affected, and its power lost, so that the person becomes blind.

The most frequent and therefore the most important effect is opacity of the cornea and the lens; the latter forming a cataract. Both eyes are usually affected, and the cataract may be complete or incomplete; in the second case, in a few instances, improvement may take place.

The treatment, if any is considered advisable, is the same as in the ordinary forms of cataract. This is followed by satisfactory healing in itself, but in a good many cases sight remains very poor, owing to damage in other parts of the eye—such as the optic nerve. (*See also* AMBLYOPIA; DEFECTIVE VISION; EYE; VISION.)

BLISTERING.—Blistering is sometimes carried out as a remedy in the treatment of cases such as lumbago, rheumatism, neuritis and other painful conditions due to inflamed nerves. Irritating substances are applied to the skin which raise a blister at the point where they are applied. After the blister has formed, the "nagging" pain from the nerve is usually much relieved. The blister will not be very painful. When it has formed sufficiently, the blistering substance should be removed, and once the blister has burst, some bland soothing ointment should be applied.

BLISTERS ON THE FEET.—People whose feet are inclined to blister easily should see that their shoes are a good fit, with soles that are not too hard and soft uppers. Hard leather may be softened by soaking it in castor oil. Thick socks are always necessary when heavy boots or shoes are to be worn. These socks should be a good easy fit, and it is important to see that they have no seam in the sole of the foot if they are to be worn for a long tramp. Knots and lumps in the wool should be teased out before wearing, and of course large darns will almost certainly cause the delicate foot to blister if they are in a part of the sock that will be pressed on by the shoe. To keep the feet fit, bathe them night and morning, and dry very carefully—especially between the toes—and powder with some good toilet powder. It is a good plan to rub the feet with methylated spirits which dries and hardens the skin. An old army route-march tip is to soap the socks. To do this, turn them inside out and rub the feet of them hard with a just moistened cake of soap. Scales of soap stick to the sock, and oil the skin, thus preventing friction and blisters.

If blisters form in spite of these precautions, wash the feet well and dry carefully. Rub over with methylated spirits, and then puncture the blister with a needle which has been sterilized by holding it in a flame. Using a clean handkerchief or piece of linen, gently press out the fluid while

taking care not to break the blister. Cover with a piece of lint or clean linen. If the blister occurs at the beginning of a "hike" and the hike is to be continued, be very careful to keep a good wad of cotton-wool or lint or a corn pad over the place, or the skin of the blister will be rubbed off and an open sore will result with the most painful consequences for the rest of the journey. Many hikers find that it well pays them to carry a second pair of walking-shoes into which to change during the walk, when the first pair has become hot and sticky. Others cling to the same pair of old tried friends, until such time as they will no longer take another new sole and have to be reluctantly consigned to the dustbin. However one feels about this matter, there is one rule that should never be varied, and that is to wear in and know your walking-shoes before you set out on your hike, and never, never, be dependent on a new untried pair if you are seriously going walking, even if it is only for a day. (*See also* SUPPLEMENT ON BEAUTY CULTURE; FEET, CARE OF.)

BLOOD.—Blood is the fluid which circulates through the heart, the arteries and the veins, and supplies nourishing material to every part of the body. In the veins it is dark red, and in the arteries bright red; but when exposed to air it becomes thickened and divides into a red clot and a yellowish watery fluid called *serum.* The amount of blood in the body is now considered to be roughly one-twentieth of the total weight of the body, and in a healthy person, the blood consists of 78% of water and 22% solids. In the body the blood-vessels form a completely closed channel through which the blood ceaselessly circulates, and never escapes except in case of an accidental escape which we call bleeding or hæmorrhage. It is, however, always collecting new substances and discarding other substances through the walls of the blood-vessels by a process which is technically known as *osmosis.*

The first duty of the blood is to feed the body, which requires a large number of different substances to keep it in health, each one of which must be present in the blood and must be carried to the part of the body where it is required. In addition, the materials for all the *secretions* or juices which the body forms through its various organs are obtained from the blood. Some of these secretions for which the materials are obtained from the blood are used for the special purposes of digestion, etc., but in some cases, notably that of the secretions of the *thyroid* and *suprarenal glands,* they are poured back into the blood where they carry out the purpose for which they were destined.

Again, the blood acts as a carrier of oxygen to the tissues from the lungs. The red colouring matter, or *hæmoglobin,* of the blood is the agent by which this carrying of oxygen, or *oxidation,* is performed. Heat is also distributed throughout the body by the blood, which receives heat at various points in its route and thus helps to keep the whole body at an even temperature. For instance, in passing through the muscles and glands, which are heat-producing bodies, the blood picks up heat, which is cooled off in the *capillaries* or little blood-vessels near the surface of the body.

Blood, as well as feeding the body and providing the materials with which the various organs of the body carry on their own specialized work, has also the very important duty of ridding the body of waste matter, and is therefore an important part of the drainage and scavenging system of the body. *Carbonic acid* formed in the tissues is not wanted by the body and is carried to the lungs and there is breathed out; other waste materials are changed into urine, sweat, urea, etc.

In appearance, the blood is a red, sticky, non-transparent fluid. It is composed of a pale yellowish fluid called *plasma* in which float enormous numbers of minute bodies called *corpuscles* and *platelets.* The blood corpuscles are red and white in colour. A method of estimating the numbers of these corpuscles has been invented by means of which the number of red and white corpuscles in a cubic millimetre (roughly a pin-head) of blood is calculated. The average number of red cells is round about 5,000,000, and of white cells is 10,000. The red corpuscles are called *erythrocytes* and the white ones are *leucocytes.*

The red blood corpuscles are circular discs which contain hæmoglobin, a compound of iron which has the power of attracting and combining with oxygen, the part of the air which is absolutely necessary to keep us alive. By means of this power the red cells

act as carriers of oxygen from the lungs to the tissues. These red cells are always being renewed, and the old dead ones are destroyed by the liver or spleen and are got rid of by means of the bile.

The white blood corpuscles are larger and very much fewer in number than the red ones. They possess the power of moving about in the blood-stream and are often described as the scavengers of the body, as they are able to eat up and destroy invading foreign bodies, such as germs. An invasion of germs into the blood causes a great increase in the numbers of these white blood corpuscles. They make their way to the point of invasion and wage war on the intruders; this process is called *phagocytosis* and it is by means of it that the body is protected from infection by germs.

The *blood platelets* are disc-shaped bodies, which are colourless and smaller than the red corpuscles. Their origin and duty is not definitely known, but they are thought to play a part in the clotting of the blood.

The blood *plasma* is the watery fluid which contains the corpuscles and platelets. It is the nourishing substance which feeds the tissue cells of the body.

Blood, Examination of.—A method of diagnosis of disease which is used a great deal in modern medical treatment is the examination of the blood. A large drop of blood is obtained by pricking the patient's finger-tip or lobe of the ear, and drawing off the blood with a pipette. To obtain a blood-count or calculation of the number of the red and white corpuscles in the blood, a smear of blood is placed on a microscope slide and is placed under a high-powered lens. Then the number of cells in a given small unit can be counted and the total number roughly obtained by multiplication. In anæmia the total amount of corpuscles is considerably diminished, and the diagnosis of the serious disease called pernicious anæmia is made certain by the very small number found in the blood. The proportion of white to red corpuscles, the amount of hæmoglobin and the shape and size of the corpuscles, all are important in the diagnosis of disease. The rapidity with which the blood clots (or coagulates) is also of great importance, as for instance the clotting is slower in jaundice, purpura, dropsy, etc. Malaria parasites are also found in the blood of malarial subjects. When an individual requires a *transfusion of blood* it is very important that the blood of the donor, or person who gives the blood to be transfused, should be of the same type as that of the patient or there may be a serious reaction and collapse. For this reason the different types of blood are divided into groups, and the hospitals and Royal Red Cross Society keep a register of donors willing to give their blood for transfusion, together with the group to which their blood belongs.

Blood Heat.—The normal temperature of the blood is about 100° F. When taking the temperature with a thermometer, however, the heat is judged to be about 98·4° F., as it is not easy to take the temperature of the actual blood itself. It is the constant circulation of the blood which keeps the body at the same temperature.

BLOOD-POISONING.—A condition of poisoning of the blood, due to the presence of germs or the poisons or toxins they produce. Blood-poisoning may arise from an infected wound or any other source of infection causing fever and other symptoms. (*See also* SEPTICÆMIA.)

BLOOD-PRESSURE.—By blood-pressure is meant the force with which the blood is pumped along the arteries by the heart's beating. The strength of the heart's muscle, the elasticity of the walls of the arteries, and the volume of blood in the arteries are all important factors in determining the blood-pressure. In diseases which are accompanied by great weakness, such as anæmia and heart failure, the blood-pressure is *lower* than normal, whilst in many other diseases it is *higher* than normal In middle-age and old-age high blood-pressure may be a troublesome and even dangerous condition.

The blood-pressure is measured by an instrument called a *sphygmomanometer*. The normal pressure varies at different ages and it is usual to say that the normal pressure for any individual is 100° plus half the age in years. A pressure of 155 or over is high blood-pressure or *hyperpiesis*. This condition may be constitutional, caused by disease, or due to an increased volume of blood from over-eating or over-drinking. There may be temporary high blood-pressure from strong emotion, anger, pain, or exercise.

The symptoms caused by high blood-pressure are breathlessness on exertion, palpitations and a feeling of discomfort in the region of the heart, dislike of lying on the

left side, headaches, giddiness, noises in the ear, irritability and loss of the power of concentration. In worse cases there may be bleeding from the nose, numbness and tingling in the limbs or cramp and coldness in the legs. There may even be temporary blindness and a stroke.

Where high blood-pressure is present the patient should moderate his manner of living, so as to avoid mental and physical strain and he should obtain a sufficient amount of rest. The diet should be cut down. Meat and alcohol are best avoided and smoking should be cut down to a minimum. Fish, poultry, eggs, fruit and vegetables are the best foods.

The general health must be watched and constipation should be avoided, a small dose of Epsom salts being taken every morning, and a calomel pill once a week. It is a mistake to try to lower the blood-pressure too much, as often a particular individual may require a somewhat higher blood-pressure than usual to ensure good health. A course of treatment at a spa, such as Harrogate, is often of benefit.

Low blood-pressure or *hypopiesis* may be merely an individual peculiarity, for one person may have a blood-pressure lower than the average, just as another may have a higher one. But it may be due to disease of the suprarenal glands, such as Addison's disease. It may be the result of severe loss of blood, chronic weakness as in cancer, some forms of heart disease, and conditions like myxœdema and diabetes. It is also frequently present in states of anaphylaxis and intestinal obstruction. The condition often comes on suddenly as in shock or fainting and is then only temporary, or it may be long continued. The blood-pressure is said to be low, if the reading is below 110° in an adult.

The patient will complain of weakness, a perpetual tired feeling, sleeplessness, headache and giddiness. In an acute attack such as shock after an accident, a quick means of raising the pressure for a short time is to give an injection of adrenaline solution. Ephedrine sulphate tablets taken by mouth thrice daily are very useful and in Addison's disease the new treatment by a gland preparation called eucortone should be tried. Rest is a very necessary part of treatment. The diet should be mixed with a sufficiency of vitamins and at least three pints of liquid a day. Iron and arsenic tonics will be given for anæmia and if the low blood-pressure is due to weakness of the heart digitalis may be prescribed. Where the low blood-pressure is due to bleeding or shock the patient must be kept warm and may require injections of salt solution into the veins.

BLOOD-SPITTING.—Blood-spitting should always be taken seriously and the cause ascertained by a doctor. Streaks of blood in the sputum, may be only from soft gums (due to pyorrhœa) or from blood from a varicose vessel in the nose or the upper part of the throat running down into the mouth. When it is more than just a streak it should be carefully noted whether the blood is coughed up or vomited up; even a slight cough may bring up a large quantity of bright and frothy blood, and this is practically always from the lungs and is a sign of tuberculosis of the lungs, though in a few cases it may be due to heart disease causing congestion in the lung. Vomited blood is usually dark in colour, owing to the action on it of the digestive juices; this blood is usually due to bleeding from an ulcer in the stomach, and the affected person often feels faint before the blood comes up; as a general rule dark blood will also be passed from the bowel in such cases.

BLOOD TRANSFUSION.—Taking blood from one person and injecting it into another. *(See also* BLOOD; TRANSFUSION OF BLOOD.)

BLOOD-VESSELS.—The blood-vessels are the arteries and veins which carry the blood to and from the heart. The *arteries* lead from the heart and branch off in every direction carrying a supply of good blood containing oxygen to every part of the body. The *veins* lead to the heart and carry the waste products of the blood and the carbonic acid back to the heart. They are stronger and tougher than the arteries and the blood in them is dark-bluish red, whereas in the arteries it is bright red. The blood-vessels are liable to disease from the influence of the poisons that may be present in the blood. Their walls may become thickened, and it is possible for them to lose their elasticity. They become liable to break or become obstructed by clots. *(See also* ARTERIO-

SCLEROSIS; ARTERY; BLOOD; BLOOD-PRESSURE; CIRCULATION OF THE BLOOD; etc.)

BLOODLESSNESS.—Bloodlessness, or *anæmia* as it is more generally termed, is a state in which there is not enough, or not strong enough blood in the body. There are several types of this condition and the causes may be under-nourishment, hæmorrhage, cancer, wasting discharges, poisons, etc. (*See also* ANÆMIA.)

BLOTCH.—Any mark on the skin may come under the term blotch. The skin may become discoloured in certain areas for various reasons, of which constipation is the most common. Pimples or boils are often referred to as blotches, also the presence of blackheads may give the skin a blotchy appearance. In order to keep the skin clear the diet and exercise should be regulated and the bowels should be attended to daily.

BLUE DISEASE.—Cyanosis or deep-purplish colouring of the skin is a symptom of malformation of the heart. Babies with this discoloration are said to suffer from blue disease.

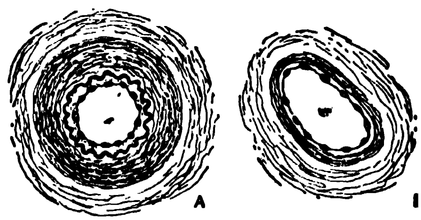
BLUE OINTMENT.—Mercury or blue ointment is used in the treatment of syphilis and many other conditions, and rubbing on the skin is one of the best ways of making sure that it is absorbed. The ointment may be put inside the sock, for then it is rubbed into the foot while walking. A very excellent way of applying it to children is to smear it on a flannel binder which is worn round the abdomen. Blue ointment is also used for destroying lice.

BLUE PILL.—This is a pill composed of mercury, liquorice, glucose and glycerine. It is an excellent remedy in cases of headache, constipation, furred tongue, feeling of weight over the liver, and general lassitude. The blue pill at night and black draught in the morning has long been a favourite combination.

BLUE STONE.—Copper sulphate, popularly termed blue stone, is applied as a caustic. It has been given as a rapid emetic in cases of narcotic poisoning, three or four grains in water every few minutes until vomiting occurs. It can be used locally for eye affections and given internally in very small doses in cases of severe diarrhœa and cholera.

BLUSHING.—This is a symptom usually arising from general nervousness. The circulation of the blood is greatly influenced by the nervous system, and when an emotion, sometimes pleasurable, sometimes painful, is experienced, the blood-vessels and the small arteries suddenly become dilated, thus causing a hot flush to be felt on the skin. Blushing occurs more frequently during the adolescent stage and also during the change of life in women. In shy and nervous persons this embarrassing habit often causes a great deal of distress. The only remedy is to force oneself to take an active interest in other people in order to break away from shy habits.

BOILS.—A boil is a festering sore which may appear on any part of the body. It is generally very painful to the touch, with a core in the centre. It is due to a microbe which has found its way under the skin. Boils may be found in healthy as well as unhealthy persons. Certain diseases may be the



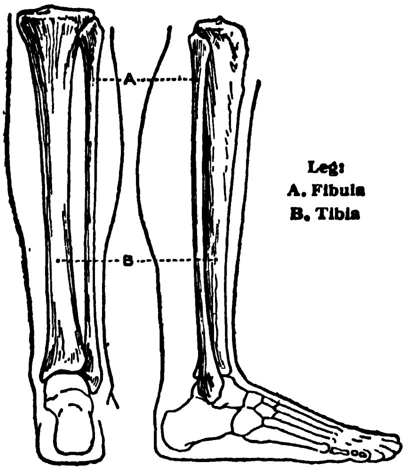
Blood-Vessels:
A. Artery B. Vein

original cause of boils appearing on the skin, or continuous irritation such as occurs in the wearing of a collar. When a boil occurs in persons who are otherwise quite healthy, the patient should be given some opening medicine, and a fomentation must be applied to the boil until it comes to a head and breaks. Boils not infrequently arise in persons whose constitutions are evidently in an unhealthy state. In such cases a tonic should be given and the bowels should be regulated daily.

One of the most painful sites for an attack of boils is the ear, and it would be advisable to call in the aid of the doctor in order to syringe this delicate organ carefully. Warm fomentations of boracic lotion and dressings of boracic lint or antiphlogistine should be applied several times daily to the inflamed part, and care should be taken not to spread any infection to other parts of the body. (*See also* ABSCESS; CARBUNCLE; FURUNCLE.)

BODY.—The study of the make-up or structure of the body is called *Anatomy*, and

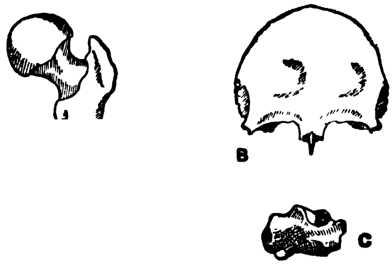
of its working or functions is *Physiology*. The entire bony structure of the body is the skeleton, consisting of the ***skull***, which includes all the bones of the head, the *spinal column* or backbone, to which are attached

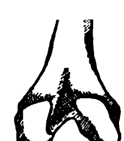


Legs:
A. Fibula
B. Tibia

the *shoulder girdle* with the ribs below, and, at the lower end, the *pelvic girdle*. The legs are attached to the pelvic girdle and the arms to the shoulder. The backbone supports the body in the upright position, the ribs form a protective cage in which the breathing apparatus and the heart are found, together with the upper parts of the abdominal organs. The pelvic girdle similarly protects the lower abdominal and reproductive organs. The backbone also serves as a protective channel for the spinal cord. The skull contains and protects the exceedingly delicate substance of the brain and the organs of sight, hearing, smell, and taste. The bones of the body are covered with muscular tissue or flesh. The main part of the body between the head and the lower limbs is called the trunk. It has been seen that its walls are formed of bony and muscular tissue and it contains two large cavities, the chest or thorax, and the abdomen, which contain the organs or viscera as they are called. The limbs, or appendages, are attached to the trunk. The whole body is protected by an outer covering called the skin or epidermis, which in turn is protected at points of friction by a growth of hair or nail.

BONE, AND BONES.—There are 206 bones in the human body, and these, together with cartilage, or gristle, form the general framework of the body, which is called the skeleton. In appearance, fresh bone is pinkish-white in colour, with a deep red centre. If a bone is broken across, it is seen to consist of two kinds of tissue. One sort is dense and compact in texture, and is called *substantia compacta*; the other sort is a network of spongy fibrous tissue, and is called *substantia spongiosa* or cancellous tissue, owing to its resemblance to lattice-work. The outer part of the bone is always formed of the hard, dense tissue, while the inner portion is of the spongy material. On examination under a microscope it will be seen that the two sorts of tissues are really the same porous material, except that, in the inner tissue, there is less solid matter and the pores, or spaces between the solid particles, are larger. In the living body, the bones have vessels running through them and are coated with a fibrous membrane called the *periosteum*. Through the spongy bone in the middle of the long bones of the body, runs a cavity which is filled with a material called the *medulla ossium* or marrow. In the long bones the marrow is yellow in colour, whereas





Types of Bone:
A. Long (Femur)
B. Short (Trapezius)
C. Flat (Frontal)

in the other bones, and in the ends of the long bones, it is red. The periosteum is full of small blood-vessels which run into numerous tiny channels in the outer bone substance called *Haversian canals*, and thus carry nourishment to the bone. If a bone is broken it will be seen to bleed from these minute vessels. A large artery runs through the marrow and

is called its nutrient artery. It is accompanied by one or more veins. There is also a nerve supply.

BONES CLASSIFIED.—The bones of the body are divided into four classes: long, short, flat and irregular. The *long* bones are the bones of the limbs and are employed in movement. They are levers consisting of a body, or shaft, and two ends, which fit into joints and are movable in these joints. At each end they are covered with cartilage or gristle, while the joint is lubricated with a fluid called *synovial fluid* and is thus able to glide easily, without undue friction, over the cartilage-covered end of the other bone with which it connects in the joint. The long bones of the body are the humerus, the ulna and radius in the forearm, the femur (or thighbone), tibia and fibula in the leg. The bones of the finger and toe and the collar-bone or clavicle.

The *short* bones occur in the parts of the skeleton where strength is required, and they are compact and strong bones with a limited range of motion. The bones of the wrist, ankle and instep are short bones. The *flat* bones are bones which are meant to protect delicate structures or provide broad flat surfaces suitable for the attachment of muscles. They are the skull bones, the shoulder-blades or scapulas, the pelvic bones, the breast-bone or sternum, and the ribs. The *irregular* bones are so called from their shape, which makes it difficult to describe them with any of the other groups. The jawbone, the spine and some of the bones of the skull are irregular bones.

Bones, Composition of.—Bones are composed of both animal and mineral matter in a proportion of about 33% animal or organic matter to 66% mineral or inorganic matter. The inorganic matter is chiefly calcium phosphate.

In young children the amount of mineral matter in the bones is nearly the same as the amount of animal matter, and their bones are, therefore, soft and flexible rather than brittle. These young bones are not very liable to break like fully grown bones, but they bend easily. They are like young green shoots of trees which are very easily bent but almost impossible to snap in two with a clean break like old wood. They are called "greenstick" fractures therefore. In the condition known as rickets the bones are very soft also.

Bone, Diseases of.—It sometimes happens that a child is born without one or other of the usual bones, and such absence may be found in generation after generation, or only in isolated cases. The bones most often absent are leg or arm bones. The most common disease of bone is *rickets*, which is a chronic disease seen in young children and due to faulty feeding and bad hygienic conditions. Acute inflammation of bone, which is called *osteomyelitis*, is a serious condition in which the bone is very tender and the patient has a high temperature and becomes very ill. *Chronic inflammation* of a bone may be due to tuberculosis. Various tumours arise in bone and are usually of a dangerous type. *Periostitis*, or inflammation of the covering of the bone, may be acute or chronic. All cases of disease of bones require to be seen by a doctor.

BONE-MARROW.—Marrow is the soft substance found in the middle of bones. It has something to do with the production of red blood corpuscles and is used in the treatment of some kinds of anæmia. It can be taken raw in sandwiches or on toast, or in a preparation made with glycerine. (*See also* SUPPLEMENT ON DIET AND INVALID COOKERY.)

BOOTS AND SHOES.—A person who wears uncomfortable footgear is never in perfect health; ninety per cent. of all foot troubles are due to faulty shoes. No one can walk well—or think well—whose feet are uncomfortable. The freedom of the feet, on which the whole body is poised, is essential to good walking. The ill-fitting shoe causes local discomfort, such as corns, callouses, blisters, and bunions; if too tight, it causes misshapen feet and affects their circulation; high heels cause the spine to be over-curved inwards, which has a bad effect on the digestive processes, and so on. More could be said, but there is no need to labour the point.

Shoemakers are now recognizing these facts, and boots of correct shape and smart appearance are now readily obtainable. Time and care should always be given to the fitting of boots, as feet vary quite as much as do faces, and their individualities should be considered. The height of the heel should, for ordinary purposes, be from 1–1½ inches. Serious trouble often arises through the

heels being habitually worn down on one side, and the balance of the body thrown out. A rubber "tip" or pad on the heels will correct this; or, for country wear, the rubber crêpe shoes now so much used. A rubber heel is recommended by most doctors, as the jar on the nervous system through the spine, unavoidable in walking upright, is much diminished thereby. The soles and heels should be sufficiently broad to give stability and comfort in walking. One should stand up to be fitted, as the pressure on the sole increases the length of the foot by one-third of an inch, and the breadth by one-fifth. New shoes should be gradually "broken in." For adults, a good supply of shoes is a real economy, both for health, as a change of shoes is excellent for the feet, and for the pocket. If the feet tend to sweat excessively, cork soles should be used. (*See also* SWEAT, DISAGREEABLE.)

Children especially should have well-fitting footwear, and shoes are preferable to boots. This applies also to adults, but for some kinds of work boots are absolutely necessary. With shoes, the muscles of the ankles are allowed free development, which artificial supports prevent, and neither ventilation nor circulation are impeded. Babies should have first woollen, then soft kid, shoes. Sandals are splendid footwear for children, as they are both light and well-ventilated. Children should never have heavy "substantial" boots. For one thing, flat-foot and other troubles are caused by giving the growing foot too much weight to carry about; for another, it is poor economy, as the feet grow far more quickly than the boots wear out! Crêpe rubber-soled shoes are excellent, especially for children, as the rubber is very hard-wearing, and minor faults such as "treading over the heel" are automatically corrected. They are also waterproof, which is another point in their favour, and far cheaper than leather.

When fitting a child's shoe, the great toe should be allowed to lie straight inside the shoe, i.e. the inner line of the sole should be straight, and plenty of width allowed for the toes. A child should never be made to wear shoes that he has "grown out of"; this applies also to stockings, especially in younger children, whose bones are soft and readily bent. Cramped and misshapen feet in children are frequently caused by small shrunken stockings though the shoes may be quite large enough.

Goloshes and rubber boots generally are suitable in wet weather, but should be removed as soon as possible, as they are unsuitable for prolonged wear. What keeps out the wet keeps in the perspiration. This also applies to the rubber plimsolls used in school gymnasiums: after the lesson is over, the plimsolls should be at once changed.

A word may be said on the subject of bare feet for children. Some people (generally those who have no practical experience of children) advocate bare feet in season and out of season, but under ordinary conditions the idea may be considered a counsel of perfection. If the children always played on clean sands or well-kept lawns, it would be (and is) the very best thing possible, but common sense hesitates to allow them to run the risk of infected cuts and scratches from contact with gritty roads, unclean motor-buses and trams, and school floors and lavatories. The benefits gained by bare feet, it seems, would be more than counter-balanced by the evils of ingrained dirt and infection.

BORACIC ACID.—Boracic acid or boric acid may be obtained as white crystals or as a white powder. It is used largely to keep wounds, ulcers and sores from becoming infected. A solution of boracic acid may be employed as an antiseptic wash. Boracic lint is used a great deal for dressing wounds. Boracic powder when mixed with starch forms a useful dusting powder for infants. For unpleasantly smelling perspiration of the feet a solution of boracic acid should be used and a little of the powder dusted into the socks or stockings may do much to prevent this condition. An ointment may be made up of 1 drachm of boracic acid with vaseline to make an ounce.

BORAX.—Borax, or sodium borate, consists of transparent colourless crystals, with a sweetish taste. It is an excellent antiseptic and is one of the chief ingredients of many of the popular mouth washes. As a lotion for the eyes, 10 grains are dissolved in a fluid ounce of warm water. It has been given in cases of epilepsy as a substitute for bromide in order to lessen excitability. The glycerine preparation of borax is a very good application as an emollient for sore nipples.

BORBORYGMUS. Borborygmus is the medical name for the rumbling noises often made by the bowels.

BOTULISM.—This is a very severe variety of food poisoning due to the presence of the germ called the bacillus botulinus. The toxin is present in the infected foods, particularly such foods as sausages, tinned foods, ham, fish, and canned vegetables, especially vegetables. The onset of symptoms usually occurs a few hours after the infected food has been eaten. The patient may complain of headache and usually the vision becomes blurred. There is considerable weakness in the arms and legs, but there is usually no pain and the mind is quite clear. The voice may become very weak. The tongue is furred and the temperature is usually lower than normal. The acute stage of the disease usually lasts for about 3 or 4 days. The patient should be kept in bed and the stomach immediately washed out with warm normal saline. An injection of morphine should be given as soon as possible as this delays the action of the toxin. A botulinus antitoxin should be prepared and given to the patient. Convalescence is generally very slow, and disturbances of vision may persist for weeks after the other symptoms have disappeared. Attacks of botulism very often prove fatal, and usually several people are affected who have partaken of the same food. Foods, when being prepared or canned, should be heated to an adequate temperature as the bacilli and spores are killed by heat.

Botulism is very much more common in America than it is in England. In fact it hardly ever occurs in this country, and the poisoning of several people at Loch Maree in Scotland, some years ago, was a very exceptional case. Our freedom in this country is probably due to the fact that up to date we do not use nearly as many tinned foods as they do in America, especially vegetables, which seem to carry the infection more easily than meats. Now that the canning industry has been opened up in England there might be thought to be a danger that food poisoning will increase, but this will almost certainly not be so, because we have an excellent system by which the production of our food in factories is inspected at every stage by health authorities, and British canned foods should be if anything safer than natural foods as far as botulism is concerned.

BOUGIE.—A bougie is a slender, rod-like surgical instrument which can be introduced into any of the external passages of the body such as the urethra, for the purposes of examining them. Medicated bougies are used in the treatment of vaginal discharges, etc.

BOUILLON.—The French name for a clear extract of meat. Beef-tea is the usual bouillon for invalids. Bouillon is also used for the broth on which bacteria are fed in test tubes when they are being cultivated in a laboratory for any purpose.

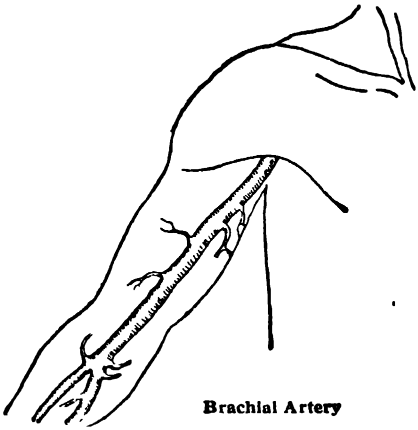
BOVINE TUBERCULOSIS.—Bovine tuberculosis is the form of consumption which cows have. It can be transferred to human beings, especially babies and delicate people, by drinking unpasteurized cows' milk from infected cows. The best milk dealers now have their cows tested periodically for tuberculosis, and are therefore able to assure their customers that they are obtaining milk from healthy cows. (*See also* TUBERCULOSIS.)

BOWEL.—The bowel is now more often called the intestine, or intestines, and will be described under that heading.

BOW LEG.—Bow legs or bandy legs are nearly always the result of forcing a weakly or rickety child to walk at too early an age. The upper part of the leg or thigh may be quite normal and the curve may be entirely in the shin part of the leg. In many cases there may be bow knee, which is just as much the result of rickets as bow legs are. It very often happens, too, that one leg may be bow, and the other leg may develop symptoms of knock-knee, so that the curve of one leg fits in with the curve of the other. This condition is due to the weight of the body pressing on the soft unformed bones of the child. As soon as the slightest tendency to bow legs or knock-knee appears in a young infant, the mother should keep him off his feet as much as possible and the legs should be bound with well-padded splints. The general diet should be attended to and plenty of fresh foods with bone-forming properties should be given as well as plenty of fresh air and sunshine. (*See also* RICKETS.)

B.P.—The initials B.P. when they appear in connection with any drug preparation show that the drug is mentioned in a book called the British Pharmacopœia. This book gives a very detailed account of most drugs used in medicine, including the origin, standard of strength in active principles, dosages

to be used in various conditions, as well as methods of preparation, etc. Drugs which are used in prescriptions must conform to the British Pharmacopœia standard unless



Brachial Artery

there is any particular reason for not doing so. The initials B.P.C. stand for British Pharmacopœia Codex, which includes various drugs and preparations additional to those mentioned in the British Pharmacopœia.

BRACHIAL.—The term brachial means anything to do with the arm. The brachial artery is a continuation of the axillary artery, which extends along the inner side of the arm. Brachial veins are the veins of the arm which accompany the brachial artery and the network of nerves in the arm is called the *brachial plexus*. (*See also* ARM.)

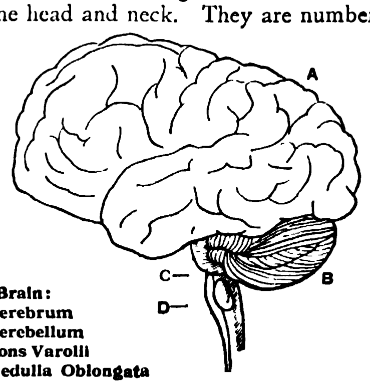
BRACHYCEPHALY.—This word is derived from the Greek and literally means shortheadedness. Certain races of people, such as the Germans, are born more short-headed than others. In various sorts of idiots the skull may be brachycephalic.

BRADYCARDIA.—This term is derived from two Greek words meaning slowness of the heart. In certain diseases the heart-beat is abnormally slow, and it is always very marked in the condition known as heart-block. A common cause of bradycardia is general weakness and lack of vigour. (*See also* HEART; PULSE.)

BRAIN.—The brain includes all that part of the great nervous system of the body which is enclosed in the skull. The normal weight of the brain is from 40 to 50 ounces; it is slightly heavier in men than in women, the average weight in men being from 49 to 50 ounces, and in women from 44 to 45 ounces.

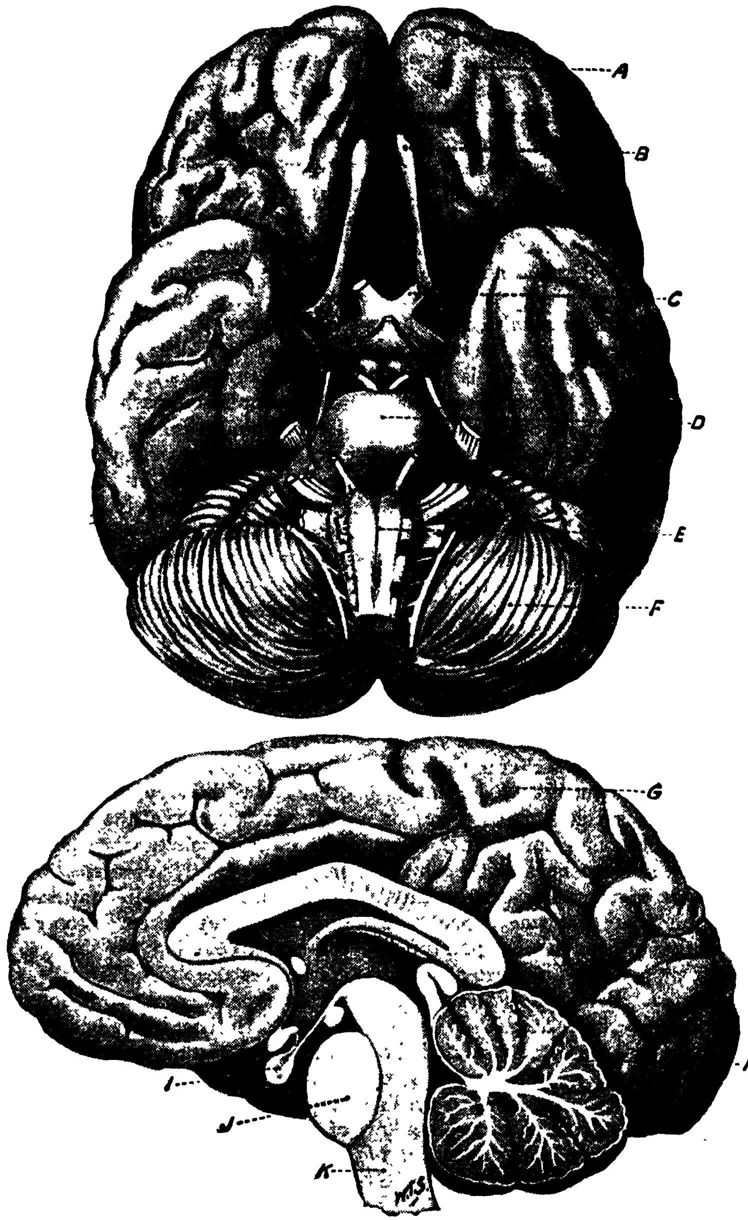
Divisions of the Brain.—The largest part of the brain consists of the "big brain" or "cerebrum," which occupies about two-thirds of the total area of the skull and consists of a mass of nervous tissue thrown into many folds. The "little brain" or "cerebellum," lies at the back of the skull and is also thrown into folds, but these are very fine and delicate as compared with those of the big brain and resemble in appearance the fine leaves of a fern. Uniting the two halves of the little brain is a wide band of nervous tissue, called the "bridge" or "pons," and this "bridge" is continuous below with the enlarged upper end of the marrow of the spine, which is called the "bulb" or "medulla." These are the four chief structural divisions of the brain: the "big brain," the "little brain," the "bridge," and the "bulb."

Nerve Centres in the Brain.—Attached to the under-surface of the brain, mainly to the "bridge" and to the "bulb," are twelve pairs of nerves, by means of which we are able to use our special senses of smell, sight, taste and hearing. These nerves also control the movements of the face muscles, the movements of the eyes, the movements of chewing and the movements of the head and neck. They are numbered



Brain:
A. Cerebrum
B. Cerebellum
C. Pons Varolii
D. Medulla Oblongata

in order from one to twelve; but each has, in addition, a Latin or Greek name. Although each nerve has its own independent sphere of action, yet the combined action of two or more nerves may be necessary to produce one particular effect. For instance, in order to obey the doctor's command to "Put out your tongue," the



THE BRAIN:

UNDER SURFACE OF THE BRAIN

A. Frontal Lobe
B. Olfactory Bulb (from which emerge the nerves of smell)
C. Optic Nerve (nerve of sight)
D. Pons Varolii
E. Medulla Oblongata
F. Cerebellum

SECTION THROUGH THE BRAIN

G. Cerebrum
H. Cerebellum
I. Pituitary Body
J. Pons Varolii
K. Medulla Oblongata

twelfth nerves (one on each side), which control the muscles of the tongue, must be working properly. But to experience the sensation of taste on the tongue, as for example, when we say that sugar "tastes" sweet, a complicated arrangement of the action of at least three, if not four nerves, is required. A message is sent from the tongue along the path of the fifth and ninth nerves which reaches certain nerve cells in the "bulb." From there an outgoing message is sent along the path of the seventh nerve, which is transmitted to the nerve endings in the substance of the tongue by a special nerve of taste which is linked up with the fifth nerve. The act of swallowing is a very complicated one and needs the control of three nerves, the ninth, tenth and eleventh, for its perfect performance. Similarly, when we look from one side to the other, we are performing a very complicated movement which is controlled by three other nerves, the third, the fourth and the sixth.

The seventh nerve is of special interest: it controls the movements of the muscles of the face, and so, our facial expression. Sometimes, when people sit in a draught, with the air blowing strongly on one side of their face, this nerve, which on the face lies very close to the surface of the skin of the cheek, "catches cold," as it were, or more correctly, becomes inflamed. Then for a time, it ceases to be able to control the movements of that side of the face, with the result that that side of the face becomes partly, or completely, paralysed. The unfortunate person who has so acquired what is called a "Bell's palsy" (after Sir Charles Bell, who first described it), is unable to close his eye on the side of the inflamed nerve, and so may get a sore eye from the lids not being able to brush away small particles of dust as they normally do. In addition, his face looks "one-sided" because the usual creases on that side of the face are smoothed out. He cannot whistle or smile properly because he cannot use the muscles of both sides of the lips, and very often he is unable to taste on the side of the tongue corresponding to the affected side of the face. The condition, though very unpleasant and unsightly, is not dangerous and always recovers completely, although it may, in older people, take months, rather than weeks. The only sequel—and this only happens in a few instances—may be that slight jerking movements, which occur without the person's knowledge, may take place in the muscles on the side of the paralysed muscles whilst they are recovering their power, and these jerks may keep on for some months. It has been found by experience that these jerking movements tend to occur more frequently in people who have had energetic electrical treatment for the condition. This should be avoided. Gentle massage, though not necessary, does no harm. (*See also* FACIAL PARALYSIS.)

The complicated paths by which each part of the brain is linked up with every other part, and the means by which all parts of the body are brought into communication with the brain, cannot be described here. But in a few words, the brain taken as a whole, consists of a countless number of nervous elements, consisting of nerve cells and their two types of processes. One type of process carries messages or impulses towards the cells; the other type carries impulses away from the cells. By means of these two sets of processes the different parts of the brain and spinal nervous system are brought into relation with each other and with every other part of the body.

The grey matter of the Brain.—The nerve cells in the brain form what is called the grey matter; their processes form the various strands of the white matter. In the "big brain" the grey matter lies on the outside of the brain, covering the surface; the white matter lies deeply. Through much painstaking experimental work done mainly by British scientists, it has been made possible to map out certain parts of the grey matter of the "big brain" into various areas and to predict what will happen if one or other of these areas is injured or diseased. One such area is called the "motor" area, because when we wish to move our limbs or any part of our bodies, it is this area of the brain which enables that movement to be carried out, i.e. the message is sent from this area down through the brain to the spinal cord, then is transmitted along a nerve and finally reaches the muscles, which obey the message they have received by contracting, thus causing the required movement to take place. If this area is damaged, the side of the

body on the opposite side to that damaged is paralysed, because the path taken by messages from the motor area crosses to the opposite side of the brain at the level of the "bulb." Other well-defined areas of the grey matter are those concerned with the appreciation of sensation. By "sensation" we mean any experience which reaches us from our surroundings and of which we become conscious. The area for sight, for example, is situated at the back of the brain, so that we really see with the back of our heads, for if this part of the brain is injured or destroyed by disease, no matter how perfect our eyes may be, we become blind. There is a special and very important area of the brain which enables us to recognize the position of our limbs in space, without the aid of sight; and the same area tells us the position, size and shape of objects with which our limbs may come into contact. The ease with which we are able to distinguish the various objects in a pocket, for example, without using our eyes, is entirely dependent on this area of the brain. If it becomes damaged in any way, we lose this power. But the greater part of the "big brain" is composed of what are known as "silent areas," because nothing is known about them. They are presumed to be concerned with the intelligence and mental well-being of the individual, since large parts of these areas can be destroyed without in any other way apparently causing ill-effects, but the intelligence suffers. These "silent areas" are situated in the foremost part of the "big brain," and it has been noticed by many that in disease of this part of the brain the intelligence suffers first.

The *little brain* controls our balance and so enables us to alter our position in space as the need arises. It is also concerned with keeping the muscles in good tone, that is to say, in that state in which they will be ready to contract or relax to the best advantage. If there is disease of one side of the "little brain," this state of tone is lost on the whole of the side of the body corresponding to the side of the "little brain" affected, and the limbs on that side feel "floppy," and are clumsy and awkward in their movements. Balance is badly maintained and in walking the person tends to fall to the side of the damaged "little brain." In advanced disease of the "little brain" these signs are so obvious that the untrained eye can see them, but in the early, and the only curable stage, it requires the services of a specialist tc detect slight signs of disease.

Diseases of the Brain.—The brain is liable to suffer from the same types of disease, broadly speaking, as any other organ of the body, but owing to the special nature of the tissue of which it is composed, the results of such disease processes are of a peculiar character. In order to understand this, it is necessary to appreciate that the brain is enclosed in a box—the skull—which cannot expand. Therefore, anything which increases the size or weight of the brain or its coverings will cause a certain amount of extra pressure inside the skull and this pressure not only produces pain, but many other symptoms, as well as destroying the delicate nervous tissue. Another important point is that the essential elements of the nervous system, the nerve cells and their processes, once destroyed, never re-form; their place is taken by scar tissue, which is incapable of receiving, conducting, or transmitting messages or impulses. So if a nerve cell dies, or is killed by some disease process, that unit of the nervous system can never be replaced. It has not yet been discovered whether each unit is at work all the time, but a loss of only a few nerve cells can often be shown under the microscope when there have been many symptoms of diminished nervous activity during life. Because of these two facts, the enclosure of the brain by a rigid box and the failure of the nerve cells to re-form once they have been destroyed, it should be easy to understand that in the brain the symptoms which arise from any particular disease depend not so much on the nature of the disease, as on the position in the brain in which the disease is operating. For example, a slowly progressive cutting off of the blood supply such as occurs in some diseases of the arteries, will produce exactly the same effects as a tumour pressing on, or growing in a particular situation, as far as symptoms are concerned. The expert has then two problems to solve in dealing with disorders of the brain; firstly, where is the disease, and secondly, what is its nature.

To say where a disease is present in the brain may be almost impossible, or on the other hand, may be very simple. If there is some disorder of the "little brain," for example, the signs are so definite and

unmistakable, that it is only a question of determining the nature of the malady. Similarly, if one of the areas of the brain whose special action is known, such as the "motor" area, becomes diseased or injured, certain signs (in this case, signs of paralysis of the opposite side of the body) occur, which enable the nerve specialist to say with certainty that something is amiss with this particular region of the brain. In the "bridge" of the brain or the "bulb," where many of the nerves coming out of, or entering the brain are attached, and where many conducting paths are crowded together, destruction of these will cause interference with the normal action of the movements controlled by these nerves and conducted along these paths, so that it is a comparatively simple matter for one who knows the structure of the brain to say when this region is damaged. But in the "big brain," where so many "silent" areas exist, of whose action and conducting paths we know nothing, it may be almost or quite impossible to decide where the disease is, until it reaches an area whose action gives us some information. In some cases it may not, for the same reason be possible even to say on which side of the brain the disease is, but if the disease lasts a sufficiently long time, it is rare for the expert not to be able to determine the position of the disease.

Treatment of Brain Diseases.—From the point of view of treatment it is of the greatest importance to establish not only the position of the disorder, but its nature. The various misfortunes that may befall us may be summarized as follows: there may be some failure in development; our disorders may be the result of injury, or of infection by a microbe which causes a reaction known as inflammation; animal parasites may make our bodies their temporary refuge; our tissues may wear out before the normal span of life is over, a process which we call degeneration; finally, tumour growth may take place and destroy or replace normal tissues. The brain is not exempt from any one of these misfortunes, but from the practical standpoint some are vastly more important than others. For failures in development, which may be of any degree from such slight ones as cause only weakness of one side of the body and limbs up to those in which the child has so little brain developed that it is a complete idiot, we can do nothing except to ensure that the most is made of such intelligence as is present, and of such movements as are possible. Very often it is advisable in the interests of the mother and other members of the family that such unfortunate children should be placed in institutions, and it is always difficult to persuade the mother that where the brain is so badly developed that the child can never be normal mentally, the child will never miss that maternal care which the mother, naturally enough, wants to lavish upon the weakling. For the sake of the fathers and other children it is best that such children as are mentally unfit should be looked after in special homes.

Injuries to the Brain are always serious and should never be treated lightly. They usually follow blows or falls on the skull, and nearly always are accompanied by some period of unconsciousness. If the brain has been only slightly damaged, the injured person recovers from this unconsciousness and is then said to have had *concussion.* If there has been extensive damage to the brain tissues, on the other hand, unconsciousness deepens into what is called coma, a state in which the breathing becomes noisy and hurried and from which it is impossible to rouse the person. It is rare for people to recover from such extensive damage to their brain as results in coma, for this state means that there has been a tearing of some of the blood-vessels of the brain and that bleeding has taken place into the brain substance, an almost invariably fatal accident. In cases of only slight damage to the surface of the brain, what is called concussion, the danger is that if the patient does not take care to lie up in bed until such time as his doctor permits him to get up, he will develop a severe headache, which may persist for months. A long period of rest in bed, after even a few minutes complete loss of consciousness from head injuries, is essential if this headache is to be avoided.

The infections of the brain which give rise to inflammations are so many and varied that it is impossible to consider them here, except to say that as the majority of these infections do not attack the essential elements of the brain, the nerve cells, but rather the tissues supporting them, and their fatty coverings, the diseases produced by these infections, though they may be disabling,

are in many cases consistent with long life. Treatment may stay the progress of these diseases, but cannot cure. (*See also* CEREBRO-SPINAL MENINGITIS; MENINGITIS.)

The wearing out or premature dying off of nerve cells before the rest of the body cells is one of the characteristic features of old age. The failure of memory for recent events, with constant repetition of stories of "When I was a boy" is a well recognized picture of the elderly. But sometimes this wearing out of the nerve cells occurs at an earlier age and then the picture is a sad one. In association with the failure of memory, weakness of the will develops and all the patient's mental activities become lessened. In some cases mental deterioration takes place so rapidly and so completely that the patient is unable to carry on his life in a normal way and it is necessary to have him cared for in a mental hospital, if sufficient attention cannot be given at home. These patients become as children and are as easily led, and it is in these cases that unscrupulous relatives or attendants find their opportunity to influence the unfortunate victim to alter a will so that they may benefit. (*See also* MENTAL DISEASE.)

Tumours of the Brain.—The brain is one of the commonest positions in the body in which tumours may develop. During the last twenty years surgery has made such wonderful strides that if the signs of tumour formation are detected early enough, there is every chance that an operation on the brain can be undertaken and the tumour—if not situated too deeply in the substance of the brain—removed, at least in part. In any case, the operation of opening the skull will relieve the patient's symptoms and prevent his going blind, which is the inevitable result of leaving the skull intact. The main, and most disastrous, effects of tumour formation in the brain are those which depend on the increase in bulk of the contents of the skull, which cannot expand. These effects show themselves to the patient by an increasingly severe headache, accompanied in the late stages of tumour formation by vomiting, which is not associated with the taking of food. The headache is nearly always worse in the morning, when the patient first gets up, and during the day it improves somewhat. The increase of pressure inside the skull leads eventually to destruction of the nerves behind the eye, so that failure of vision is noticed. But long before the patient notices that he cannot see so well a doctor can, by means of an instrument with which he looks at the back of the eye, tell at once in a very large proportion of cases whether a tumour of the brain is present. In many cases also it is possible for the specialist in brain diseases to say exactly where the tumour is lying, from the signs he is able to observe. It may be that certain nerves on one side of the brain are not acting as they should owing to pressure from the tumour, or an area of the brain which can be recognized from the results of damage to it may be pressed upon. The important thing is that the early recognition of the presence of a tumour is absolutely essential if any hope of a complete cure can be promised or even attempted. A number of tumours which lie so deeply in the substance of the brain that their removal is impossible, do occur, but a far larger number begin to grow from near the surface of the brain, and it is in the interests of patients suffering from surface growths that early diagnosis of their condition should be made. (*See also* MENINGITIS; CONCUSSION.)

Brain Fag.—Any excess of mental strain or worry may cause the brain to feel fatigued. Over-indulgence in alcohol, sexual excesses, or the abuse of drugs, such as morphia or cocaine, may be the exciting cause. The symptoms are generally restlessness, insomnia, and the inability to concentrate on any intellectual form of work or reading. Treatment consists of rest, nourishing foods, and plenty of open-air exercise with a sufficiency of sleep.

Brain Fever.—This is an old-fashioned term for meningitis. (*See also* MENINGITIS.)

BRAN.—Bran is the outer covering or husks of any cereal. It contains little or no food value, but is taken in the form of biscuits to provide "roughage" in a diet which would otherwise be too thoroughly digested without leaving enough residue to give sufficient bulk to the stools. (*See also* SUPPLEMENT ON DIET AND INVALID COOKERY.)

BRANDY.—Brandy contains 40 to 50% of alcohol, and good cognac may cotainn as much as 60%. This spirit is largely used in medicine as a stimulant, and may be given to revive a fainting patient. Brandy is considered to be very rich in energy-giving and restorative properties. (*See also* ALCOHOL.)

BREAD.—The chief bread-making cereals are wheat, rye and maize. Wheat is specially suitable for bread-making on account of the large amount of gluten which its flour forms when mixed with water. Carbonic acid gas is produced by the yeast fermentation which spreads through the dough while in the oven, thus forming the texture of the loaf. During the baking process, bread undergoes many changes. The water and alcohol (caused by fermentation) are evaporated, proteins are solidified, and the starch becomes gelatinized. White bread is lacking in protein and fat, but is very rich in carbohydrates. The deficiency of fat is usually made up by the habit of eating butter or other substances with the bread. The mineral phosphates which are lacking are generally replaced by milk. The percentage of vitamins is very small and should be supplemented by such foods as eggs, fruit and fresh vegetables, nuts and pulses. White bread should not be regarded as a staple food, especially for children, as it is deficient in many vital and essential elements. When bread was "the staff of life," white bread had not been invented, and all bread was wholemeal.

Wholemeal bread contains more protein, fat, salts and roughage, and also contains many vitamins derived from the germ and bran. The presence of the wholemeal which acts as roughage, is an excellent remedy for constipation. Wholemeal bread is especially good for growing children and there is less danger of ill health and disease arising through vitamin deficiency when wholemeal bread forms a part of the staple food of the diet. For growing children cod-liver oil, milk and milk-fat products should be added to the diet to ensure the proper formation of bone and teeth, and prevent the occurrence of rickets.

Starch reduced breads are used a great deal in special diets. This is a valuable addition to the diet of those who suffer from carbohydrate dyspepsia, and while its tissue-building properties are nearly four times that of ordinary white bread, its fattening properties due to surplus starch are entirely absent.

Malted breads are usually much more moist than the ordinary white breads and the percentage of starch is considerably lower. It has a characteristic sweet flavour with a slightly "gummy" crust and is easily digested.

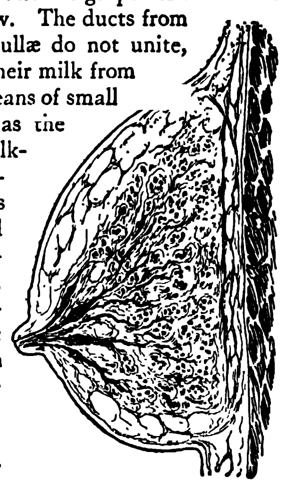
Milk bread is made by substituting a portion of milk for the water used in mixing the dough. It is particularly beneficial to children because of its added nutritive value. (*See also* SUPPLEMENT ON DIET AND INVALID COOKERY.)

BREAST.—The term breast is commonly used for the front part of the chest, including the two *mammæ* (breasts) and the breast-bone, but in medical language the term breast means one or other of the mammæ or glands which furnish milk. The breasts exist in the male as well as the female, but as they are not used in the male they are present only in an elementary state of development. In the female the breasts are two large hemispherical prominences which lie to the right and left of the breast-bone on the front of the chest. They differ greatly in size in various individuals and at different times in the life of the same individual. In childhood there is little difference to be seen between the breasts of girls and boys, but at the age of puberty they enlarge very considerably in the female but not in the male. When the body has attained its full growth the breasts remain stationary, too, until pregnancy takes place, when they immediately begin to swell. During the period of lactation or nursing, the breasts are swollen and reach their largest size. After weaning they return to a smaller size, but will usually remain larger than they were before childbearing. Other changes take place at this time which will be more fully described under the headings of PREGNANCY and CHILDBIRTH. The breasts in the male remain undeveloped throughout life. The female breasts shrink after the menopause or change of life, and in old age become completely atrophied.

The breasts are composed of glands and vessels imbedded in fatty tissue. In the centre of each breast is a small eminence called the nipple. It is a deep rose colour, and is surrounded by a circle of pink called the areola. This areola remains a delicate pink colour until pregnancy has become established when it changes to brown and remains brownish for the rest of life. The nipple is perforated in fifteen to twenty places by the openings of the milk-bearing ducts. On the areola are various small prominences which are really sebaceous glands, and contain a fatty substance that acts as a

protection to the skin of the nipple during suckling.

The mammary gland for giving off the milk is a very complicated arrangement. In the depths of the breast the milk is gathered in very tiny vessels. Several of these unite together to form little bundles no larger than a pinhead. These bundles unite again into bigger vessels called *lobules*, and the lobules converge together in groups to form *ampullæ*, or the reservoirs, which contain the milk and which lie under the areola and have direct connection with the nipple by way of tubules or ducts. The arrangement has been compared to a bunch of grapes of which the stalks are hollow. The ducts from the various ampullæ do not unite, but discharge their milk from the nipple by means of small ducts. As well as the complicated milk-secreting apparatus the breasts are well supplied with nerves, arteries and veins, and have numerous lymphatic glands which connect with the axillary glands in the armpit.



Breast: Section of Female Breast showing Milk Glands and Ducts

BREAST, ABSCESS OF.—Breast, or mammary, abscess nearly always arises from mastitis or inflammation of the breast. If pus-forming organisms find their way into the inflamed area suppuration begins and an abscess forms. These abscesses occur in one of three situations. They may be just under the skin or nipple and the pus may not burrow far inwards, in which case the abscess will quickly come to the surface and may be opened, causing little pain or discomfort. If, however, the pus forms deep in the substance of the breast. it may track in every direction and involve the whole breast. The typical signs of suppuration are present and the patient is in great pain and becomes very ill. A third sort of abscess may have nothing to do with lactation, but may start in the region behind or below the breast. when it is called a *submammary or retromammary* abscess, and may be due to injury to the breast, or to disease spreading from the lungs to the breast. It may be very chronic. *Cold abscesses* due to tuberculosis may occur here. These *submammary* or *retromammary* abscesses may in time point and come to a head below the breast or in the armpit. The treatment of breast abscess is the same as for other abscesses. Hot fomentations may be applied until the abscess points, then the breast should be opened by a surgeon and drained; great care being taken to prevent further infection. If the abscess is of large extent drainage may have to be effected by means of tubes. Usually the breast heals quickly and cleanly, but occasionally small sinuses may arise and continue to discharge. These will have to be opened and packed with gauze. Where the condition is due to tuberculosis, the tuberculosis will have to be dealt with as well as the local condition. (*See also* ABSCESS; MASTITIS; TUBERCULOSIS.)

BREAST, CANCER OF THE.—In women the commonest sites of cancer are the womb and the breast, and in the case of cancer of the breast the left breast seems to be more often attacked than the right. It follows frequently on chronic mastitis or inflammation of the breast usually in women who have had children, but may arise unnoticed in a breast that has never given any trouble. It may be the result of chronic irritation by ill-fitting corsets, bust bodices, etc., or from a blow in the breast.

The earliest symptom noticed is usually a lump attached to the skin, swollen glands in the armpit, or just a retracted or pulled-in nipple. Unfortunately, pain is not troublesome until the disease is well established, so any woman who has even the tiniest lump in her breast should have herself examined at once. Eczema round the nipple which does not clear up at once with simple treatment should also be regarded as suspicious because it is a common beginning of one form of cancer. Many women who may or may not have had children suffer from periodic attacks of neuralgia in the breast called *mastodynia;* at first they may be afraid that their pain is the beginning of cancer but an overhaul by the doctor will reassure them. They should not forget, however, that it is just as necessary for them to be on the lookout for signs of cancer as for other women who have never had any trouble with their

breasts. In early cases of cancer of the breast operative treatment, which involves removal of the breast on the affected side is very successful, and a complete cure is frequently obtained. It is the duty of every woman who has any suspicious symptom, even though it causes her no inconvenience and she has not time to be ill, to have herself examined. Delay will only make matters worse if the condition is malignant.

BREAST, DISEASES OF.—The female breast is subject to various diseases, most of which are painful and some of which are severe. Most of these diseases are related to one of the periods during which there is extra activity in the breast, namely at puberty when the breast begins to develop, during suckling or about the time of the change of life. Acute inflammation or *mastitis* occurs most often in the early days of the nursing period, although it is not rare to find it in the breasts of babies in their first few days of life. This condition in the infant readily yields to treatment and all that is necessary in most cases is to cover the part with a pad of sterile dressing such as gamgee tissue. In mastitis occurring after childbirth, a more serious condition is present and care must be taken that it does not develop into a breast abscess. Mastitis and abscess may become chronic and very troublesome. Cysts and glandular tumours may arise in the breast. Cysts may be due to chronic mastitis or may be caused by the retention of milk in women who are or have recently been nursing. Adenomata or glandular tumours may occur in the breasts of younger women whether they have borne children or not. They may be perfectly painless, small, not very hard lumps, or they may be exceedingly painful. In every case of trouble in the breast, especially if there is a lump of any description, a doctor should be consulted at once. Only if the patient comes early to the doctor can she be sure that the condition is not cancer, and if it is cancer, early removal will give a very good chance of permanent cure. (*See also* BREAST, ABSCESS OF; CANCER; MASTITIS; PAGET'S DISEASE.)

BREAST FEEDING.—Breast feeding is the natural method of nourishing the infant, and the normal mother's milk contains in proper quantity and proportions all the food materials necessary to keep the infant healthy. It also has the advantage of being in most cases germ free. Suckling her child also aids the mother's system to return in a natural way to the normal. It is therefore the duty of the mother both to her child and to herself to feed the child as Nature intended. Only in cases of grave necessity should the infant be put off breast feeding. Full details of both breast feeding and artificial feeding will be given under the heading BABY, FEEDING OF, in the SPECIAL SUPPLEMENT ON THE BABY.

BREATH, OFFENSIVE, HALITOSIS.—The expired air known as breath consists of atmospheric air which returns from the lungs saturated with water vapour, and containing carbon dioxide gas together with a minute amount of organic matter. It should never be forgotten, for cosmetic reasons no less than for health reasons, that the lungs not only act by taking in air but also by giving out soiled air.

The breath of a perfectly healthy and cleanly person is, practically speaking, odourless. In certain cases of disease, however, and in all cases of neglect of the cleanliness of the mouth, the breath acquires a more or less offensive odour. This is often, unfortunately, more noticeable to other people than to the offender himself.

The causes of bad health are very varied, though in practice they are limited to a few common reasons. The most frequent, probably, are local conditions, such as lack of cleanliness, decayed teeth, pyorrhœa of the gums, adenoids and chronic tonsillitis, and other mouth and nose conditions. Most of these causes of unpleasant breath can be avoided by strict attention to cleanliness. For instance, the teeth should be cleaned thoroughly at least night and morning, if not more often; and the denture, if worn, should be removed after *every* meal and well brushed and rinsed. Some otherwise cleanly people *never* remove their denture, with results better left to the imagination! The dentist, who should be visited twice yearly, will keep a lookout for the occurrence of pyorrhœa, caries (decay) of the teeth, and other local troubles, which should have the proper treatment.

Chronic constipation is almost equally an offender in producing bad breath. Gases produced from decay of the food which is retained in the intestine are absorbed into the blood and may be given off by the lungs.

Indigestion, with furred tongue, will also produce bad breath. In these cases temporary relief may be obtained by replacing one odour by another, i.e. by putting a small drop of oil, such as oil of cloves, on the tongue, or by eating cachous, but for permanent benefit the cause must be treated.

Smoking associated with uncleanliness (not smoking alone), the use of alcohol, onions and garlic, produce their characteristic odours, as also do some medicines when taken over a period. These are most commonly phosphorus, bismuth, bromine, iodine, and mercury in their medicinal forms.

Many general diseases give a characteristic, not necessarily disagreeable, odour to the breath; this is often very useful in diagnosis. For instance, in blood-poisoning the breath is sweet, in diabetes and acidosis fruity; in others, such as certain nose troubles, gangrene of the lung, cancer of the larynx, and acute fevers, the breath is terribly offensive. Local alleviation may be obtained, if only partially, by various methods. In acute fevers the mouth should be frequently sponged with glycerine and rose-water. If a gargle or mouth-wash can be used, hydrogen peroxide or boracic lotion is useful.

BREATHLESSNESS.—Breathlessness, or shortness of breath (dyspnœa), can only be considered a disease, or rather a symptom of a disease, when it is present while the patient is at rest. It indicates that the body is not being supplied with sufficient oxygen for its needs. and this may be due to disease of the lungs, or air passages, or of the heart. Adenoids, which is a common affection of children, causes them to go about with the mouth open, thus producing breathlessness; croup, which is also seen chiefly in children, often causes alarming breathlessness. Asthma is a condition in which this complaint is one of the chief symptoms.

In almost every disease of the lungs such as pneumonia, consumption, bronchitis, etc., shortness of breath is present, and in pleurisy the patient makes the breathing quick and short in order to avoid the pain of deep inspirations. Practically all affections of the heart, including the fatty heart of corpulent persons, cause breathlessness; and anæmia is also a common cause, especially in young women.

The treatment naturally depends largely on the immediate cause of the complaint, but in order to relieve the patient of the distressing symptom of breathlessness, complete rest in bed is advisable, and propping up with pillows may be beneficial.

BRIDGE OF ALLAN.—The spa at Bridge of Allan has been famous for its mineral waters for the last 150 years, and their outstanding feature is the large amount of calcium, bromine and iodine which they contain. The waters may be taken internally or they may be taken in the form of baths, and they are particularly good for the treatment and cure of rheumatism, gout, catarrh and bronchial asthma. Certain skin diseases may be treated at this spa, especially such conditions as urticaria and eczema. For convalescents who are in a debilitated state of health, the waters are of particular value in toning up the general state of the body. The waters have also a slight aperient effect which is of value in constipation, and they also act as a powerful stimulant to the kidneys.

Bridge of Allan itself lies in one of the most romantic districts of Scotland. On the one side are Stirling and Bannockburn with their many historical associations and on the other the delightful Trossachs country immortalized by Scott. Loch Lomond and the Rob Roy country are both within easy motoring distance, and in addition there are excellent facilities for tennis, golf and fishing.

BRIGHT'S DISEASE.—Medically termed nephritis; this disease derives its name from Dr. Bright of Guy's Hospital, who in 1827 published a paper describing its symptoms. Bright's disease includes inflammatory and degenerative changes of the kidneys. There are many varieties which include the acute, subacute and chronic stages. It is described under the heading NEPHRITIS.

BRINE BATHS, or baths in very salty water, are found to be very invigorating for patients suffering from rheumatism or debility. (*See also* BATHS; SEA BATHING.)

BRITISH PHARMACOPŒIA.—*See* B.P.

BROMIDES.—The bromides of potassium, sodium, ammonium, calcium and iron are used a great deal in medicine. Externally, they have no action whatever; but internally, they act by powerfully depressing the nervous system. Bromides are rapidly absorbed after administration, and are widely distributed throughout the body. Bromide is given off by the stomach as hydro-

bromic acid, which may give rise to indigestion. Bromides are got rid of by the kidneys rapidly at first, but afterwards more slowly, so that bromides may accumulate in the body for quite a long period after they have been taken. In cases of epilepsy the bromides are of exceptional value. They may be administered in large doses, often as much as 200–300 grains a day extending over a long period. In some cases the symptoms of the disease may disappear altogether and as a rule, the severity and frequency of the fits are greatly diminished. The bromides are used extensively as hypnotics in cases where sleeplessness is caused by mental strain or any nervous disorder. They are of little value when sleeplessness is due to pain caused by any organic disease. The sleep produced is quiet and refreshing and generally without dreams. These drugs are of great value in nightmare, or in the night-screaming of children. The usual dose for such purposes as this is from 5 grains for a child and up to 30 grains or more for an adult. Very large doses have been given in the treatment of delirium tremens, especially in combination with chloral, the patient usually appearing much quieter for this treatment. In migraine, and cases of nervous headache, bromides very often bring relief. Some cases of tetanus have recovered after enormous doses of bromide and it has also been given as an antidote in cases of strychnine poisoning. Bromide of potassium is used because of its depressing effect in cases of over-excitability of the sexual organs, but if bromides are taken for a long period, a failure of sexual vigour is produced. In whooping-cough bromides are given in order to diminish the severity and number of the paroxysms, and many kinds of neuralgia are frequently relieved by these drugs. During a sea voyage many people take bromide in order to prevent sea-sickness. Concentrated solutions have the same action as any other salt in that they cause nausea and vomiting. Liquid preparations should be well diluted, and salts should be dissolved in at least half a glass of water.

Poisoning by Bromides.—If bromides are taken over too long a period, symptoms of poisoning may appear, the condition being known as bromism. The patient complains of feeling depressed, easily fatigued and unfit for work. The sexual power becomes greatly diminished and the skin develops a rash exactly resembling some forms of acne. The symptoms may be removed by stopping all bromides. The occurrence of acne may often be prevented by administering arsenic along with the bromides.

BROMIDROSIS.—Bromidrosis is a condition in which the sweat of the body has a very disagreeable odour. (*See also* SWEAT, DISAGREEABLE.)

BRONCHI.—The plural of bronchus. The bronchi are the air passages in the lungs. After the air has been breathed in through the nose it travels to the lungs by way of the *trachea* or windpipe. The windpipe divides into two smaller tubes, one of which leads to each lung. These are the right and left *bronchi* or bronchial tubes. When the bronchial tubes reach the lung they in turn divide into numerous smaller tubes which again divide, branching like a tree until the substance of the lung is permeated with these little air vessels. The very smallest bronchi are called *bronchioles*. Inflammation of the lining of the bronchial tubes is the well-known disease called *bronchitis*. Bronchitis becomes serious when the walls of the smaller bronchioles are affected, since the air is hindered in its passage through them to the air cells, or *alveoli*, of the lung and breathing becomes difficult. Spasm of the muscular tissue of the bronchioles with swelling of the mucous membrane of the bronchial tubes is the cause of the breathlessness, which is the characteristic symptom of asthma.

BRONCHIECTASIS.—Bronchiectasis is a condition in which one or more of the bronchi become enlarged and dilated, and a cavity is formed inside the chest. The condition is usually due to a previous attack of pneumonia or broncho-pneumonia, or to the inhaling at some previous time of a foreign body such as a piece of sponge, or tooth, or bit of bone. The widened area of the bronchus once formed is liable to collect matter which quickly decomposes, with the result that the breath and expectoration have a very disagreeable odour. The patient is overtaken by severe bursts of coughing in the effort to expel the matter which has collected in the bronchiectasis. If the condition is not very bad the same treatment as for bronchitis is carried out, but it may be necessary to have operative treatment. This consists of the operation of artificial pneumo-

thorax or collapsing or closing up of the lung with the object of giving it complete rest for a long period. Recently improvement has been brought about by washing out the cavity with antiseptics introduced by means of the instrument called the bronchoscope.

BRONCHIOCELE.—A swelling or dilatation of one of the smallest subdivisions of the bronchi or small breathing-tubes in the lung.

BRONCHITIS.—Bronchitis is well known to everyone, because it is almost a national disease in the British Isles. Our climate makes us very liable to it and almost everyone has it sometime or other in the acute form, and it will be the fate of a great many of us to have the chronic type, or "winter cough" in our old age.

Acute Bronchitis.—Bronchitis in its acute form is a feverish cold with cough and sore chest. It is contagious and can be caught by others who come in contact with the sufferer. It is an acute catarrhal inflammation of the windpipe and larger bronchial tubes and is, as has been said above, very common in wet climates like ours. In healthy adult people it is rarely serious, but in very young children and aged people acute bronchitis is always a serious disease and is often fatal chiefly because of the lung complications which so often accompany it.

Acute bronchitis usually starts as a common cold and then extends down the air passages. Very often it follows an attack of influenza or infectious diseases like measles and typhoid fever. Many people are very prone to it and the slightest exposure to cold and damp or the germs of other people's colds will bring on an attack. Some of the worst cases ever seen were those due to the various poison gases used during the war. Other gases which irritate the throat are liable to bring on bronchitis.

Various sorts of germs are found in bronchitis as they are found in influenza, the common cold and other such diseases. The germ which is the cause of pneumonia, the *pneumococcus*, is often found in bronchitis which developed first after an attack of pneumonia and returns winter after winter. Sometimes the germ of influenza is present as well, and sometimes it is found by itself. The catarrh germ, which is the chief cause of the common cold, is usually present together with these other germs. Many other germs have been discovered in cases of bronchitis, but there is no particular germ which causes bronchitis and nothing else.

Symptoms.—An attack of acute bronchitis starts as an ordinary cold, and then gradually extends, first to the larynx, where the vocal cords are affected, causing huskiness on speaking. There may be pain on swallowing and on talking and the throat will feel "raw." This feeling of "rawness" extends with the inflammation to the windpipe and larger bronchial tubes and produces a dry cough which is very painful. General symptoms are fairly well marked: there is a feeling of illness, heaviness and tiredness with pains in the back and an aching feeling in all the joints. Bronchial signs begin with a feeling of tightness and rawness in the upper part of the front of the chest. At first the cough is very dry and the expectoration is scanty, but after a few days the material coughed up becomes yellowish and abundant. With the loosening of the cough the pain grows less.

Physical Signs.—The breathing is definitely of a "wheezing" character. As the discharge becomes more profuse the noises in the chest become more moist and "bubbly." In the case of children the disease is extremely liable to spread to the smallest portions of the bronchial tubes and cause *broncho-pneumonia*. The lower parts of the lungs should be examined every day in case there are small patches of this broncho-pneumonia forming.

Course.—After about a week the light fever present usually disappears and the cough becomes loose.

In children the risk of the disease spreading is much greater, and it then spreads downwards to the smaller portions of the bronchial tubes. These fine tubes become dilated and packed with matter, and broncho-pneumonia usually follows. Blowing breathing, together with a change in the general condition of the patient for the worse, such as a higher temperature, a more rapid pulse, dirty tongue, a change of colour —possibly a slight degree of blueness— especially marked round the lips, a severer and more continuous cough, and difficulty in breathing, all indicate the change to broncho-pneumonia.

Treatment.—To lessen the risk of other people catching the cold, the patient should sleep alone and, when possible, there should

be an abundance of sunlight and fresh air. A "bronchitis kettle," e.g. a kettle containing a solution of eucalyptus or pinol, should be kept near the fire so that the vapour containing one of these oils is being continually given off. The room should be kept at a constant temperature of about 65° F., but must be well ventilated. The old-fashioned coal fire is still a good way of ventilating a room. Drinks of hot lemonade and a mustard plaster on the chest are very useful. The patient must remain in bed, and drink as much bland fluid as possible. The dry cough is usually very trying, and for this the kettle will be found very useful. Dover's powder, in 5-grain doses three times a day after meals, together with syrup of codeine, or heroin linctus in doses of one teaspoonful every four hours, are the medicines usually prescribed to quieten the cough. An expectorant cough mixture is also given.

Inhalations, such as a teaspoonful of Friar's Balsam in a jug of hot water, are very useful for the dry cough. The water should not be too hot, and in practice the best way to be sure of a suitable temperature is to pour boiling water in the jug and to wait for five minutes by the clock before adding the Friar's Balsam and inhaling. Care must be taken not to inhale before the end of the five minutes as, if the vapour is too hot, the larynx may be scalded and the inflammation rendered worse than before. It is also important that one should not go from a moist atmosphere to a dry one or to a different one after the inhalation, but should remain in the same temperature. The best way to avoid this is by inhaling just before settling down for the night, though the inhalations can be repeated more often when the patient is confined to bed in a room with a constant temperature.

After one or two days the expectoration becomes more free, and then the various expectorant mixtures such as ipecacuanha wine, etc., are very useful.

In children the amount of the discharge is sometimes so great that it is difficult to bring it up. If there should be any difficulty in breathing, or should the colour become dusky, an emetic such as salt and water, or a tablespoonful of ipecacuanha wine, should be given and repeated if necessary. This procedure will bring up quantities of phlegm, and greatly relieve the condition.

Chronic Bronchitis.—Chronic bronchitis often occurs together with diseases of the heart and kidneys and is often associated with the condition known as emphysema. It may also follow repeated attacks of acute bronchitis. It is most frequent in the aged and in males. It is the cause of "winter cough" in the aged, and returns with the utmost regularity as soon as the weather gets cold and changeable. Owing to the more uniform heating of the houses it is less common in Canada and the United States than it is in England.

Symptoms.—In old men, shortness of breath, especially on exercise, is the most noticeable symptom. They "puff and blow" on going up hill or up a flight of stairs. There is no pain except that due to the cough which comes every autumn and remains all winter. During the summer months there is little cough, and the patient may be quite free from the condition.

In children, chronic bronchitis with cough, usually at night, is a common accompaniment of enlarged tonsils and the presence of adenoids.

There may be an excess of bronchial secretion (bronchorrhœa). Sometimes this is thin, but more often it is thick. It may lead to foul-smelling bronchitis. In the young the condition may persist for years without impairment of health and without apparently damaging the lungs.

Putrid bronchitis is sometimes met with, though, as a rule, evil-smelling expectoration is a sign of bronchiectasis, gangrene, abscess, or tuberculosis or some serious lung trouble.

Dry catarrh is fairly often seen. It is characterized by paroxysm of coughing of great intensity with little or no expectoration.

Treatment.—A change to a milder climate will often prevent the attack. In England the south coast towns, such as Torquay and Bournemouth, are most suitable. Egypt, Southern France, California, etc., are winter resorts in which the subjects of chronic bronchitis can live with the greatest comfort. With care chronic bronchitis may prove to be only a slight ailment.

Sometimes the bronchitis is associated with gouty or kidney conditions; these should be remedied as far as possible. A vaccine made from the patient's own germs are very useful. Great care should be taken in the early part of the winter to have

clothes of sufficient warmth to be ample protection for all kinds of weather.

BRONCHITIS KETTLE.—In the treatment of bronchitis as well as some other diseases it is necessary to keep the air at a constant moist temperature. To do this a special kettle with a very long spout which expands at the end is used. These may be hired or borrowed for the duration of the illness; but if one is not obtainable any large domestic kettle may be used with an improvised funnel of brown paper, cardboard or several thicknesses of newspaper. A second kettle should be kept in readiness to fill up the bronchitis kettle with boiling water from time to time. Where there are children in the house it is as well to make sure that they do not run the risk of being scalded by accidently knocking over the kettle, which will probably be boiling on a gas-ring or oil lamp in some unaccustomed place.

BRONCHO-PNEUMONIA. — Pneumonia which affects the bronchial tubes as well as the lungs is called broncho-pneumonia. Pneumonia proper usually starts in the lungs, whereas broncho-pneumonia affects more particularly the smaller *bronchioles*. It is more often found in children than in adults, whereas pneumonia is more frequent in older people. The condition when it arises in young children is easily recognized and is of a serious nature. The child has the symptoms of a severe cold, but is obviously much more ill than it would be with an uncomplicated cold. It may be very flushed and restless or, in some cases where the "toxæmia" is severe, may be very drowsy. The temperature is high, 103° to 105° F., and the pulse rapid, while the breathing is quickened and noisy and there is a dry cough. Broncho-pneumonia is often a complication of infectious diseases, especially of measles, for which reason measles should always be treated as seriously as scarlet fever would be. Broncho-pneumonia in infants is very liable to be fatal; and in older children, though not so dangerous to life, is still a very serious illness and one which may cause future ill-health.

Treatment in the case of an infant or young child will be on the following lines: The child is kept in bed but may be lifted in the arms occasionally to change its position. The head and shoulders should be slightly raised with an extra pillow to help the breathing. The temperature of the room must be kept the same day and night, and should be slightly warmer than the usual living-room, about 65° F. A steam-kettle should be kept going in order to moisten the air. The child's chest and back should be rubbed with camphorated oil, and kept covered with a jacket made of cotton-wool. The camphorated oil should not be rubbed deeply into the skin, but just lightly spread on and gently rubbed with a few movements of the hands. As the chest must be easily reached without disturbing a very sick child it is obvious that the nightdress must be slit up or open in the front. If the temperature is as high as 105° the child must be sponged from time to time all over in tepid water of a temperature between 85° and 90°. The diet should be of milk and water in equal parts with the addition of a couple of teaspoonfuls of sugar of milk, and a teacupful should be given by spoon or bottle every three hours. The milk may be citrated if necessary. Water should be given in sips between the feeds. Wine of ipecacuanha is given in doses large enough to cause vomiting in order to bring up the sputum from the lungs. This should not be done, however, if there is much weakness of the heart. The bowels should be opened daily by a dose of syrup of figs or a glycerine suppository. It may be necessary to give some stimulant such as twenty drops of brandy in two or three tablespoonfuls of water every few hours. Oxygen may have to be administered.

BRONCHOSCOPE.—A bronchoscope is an instrument for examining the interior of the larger bronchial tubes, by means of a tube passed down the back of the throat through the larynx and the windpipe. The science of bronchoscopy deals with the use of bronchoscopic tubes and instruments which can be passed into the lungs for the purpose of extracting foreign bodies that have been swallowed into the lung, or treating other affections of the lung. Lung abscesses that are not due to tuberculosis are also treated by washing out the lung with antiseptics passed through a bronchoscopic tube.

BRONZING.—In certain diseases, especially in Addison's disease, the skin becomes pigmented and has a decidedly bronzed appearance. It is also a symptom in

exophthalmic goitre, diabetes, and chronic arsenic poisoning.

BRUISES.—A bruise is caused by a damaging of the soft tissues under the unbroken skin. It may be of any severity, from a very slight injury to an extensive, deep-seated, and intensely painful one. In extreme cases dangerous or even fatal bleeding may occur from damage to an important organ of the body. People who suffer from scurvy, hæmophilia ("bleeders"), and fat and anæmic females, are liable to be bruised from very trivial causes.

In bruising, the blood spreads quickly through the underlying soft tissues, and is especially noticeable where this is lax, as near the eye. A bluish-black patch results, with pain, tenderness, and swelling. The temperature may rise, especially in "bleeders." In severe bruises, where there is much stretching of the skin, blisters may form. When the bruise is deep, the collected blood takes some time to reach the surface, and the bruise may show some days after the injury, as in some cases of fractured skull. Serious bruises may give rise to shock and if nerves or muscles are damaged, slight paralysis may develop. This is often seen after shoulder injuries. In alcoholic or other debilitated people infection or necrosis (i.e. death) of the damaged tissues may occur.

Most bruises heal readily, during which time the well-known alterations in their colour take place, owing to changes in the blood-pigment. If the patient is seen immediately after the accident, the part should be elevated and firm pressure applied by means of an elastic bandage. This is most useful in preventing the blood from collecting in one spot. If, however, a bruise has already formed, rubbing several times daily is the best and most speedy means of dispersing the blood. If the skin is injured, e.g. if blisters have formed, an antiseptic dressing should be put on, and massage only employed after healing takes place.

Cold applications, such as ice-bags and evaporating lotions, were formerly much advocated, and are certainly soothing. In severe cases of bruising, however, they should be used cautiously, as they are apt to lower vitality of the part, causing it to take longer to heal. (*See also* BLACK EYE.)

BRUIT.—Bruit is a French word meaning noise, which is used to denote any abnormal noise heard when listening to the heart with a stethoscope. The more usual name in English is a murmur.

BUBO.—Inflammation or swelling in a lymphatic gland. The term is usually employed in connection with swellings in the groin due to venereal diseases or plague. It may, however, be applied to swellings in other lymphatic glands.

BUBONIC PLAGUE.—This is an acute infectious fever caused by the germ called Bacillus Pestis, which is communicated to man by means of the brown and the black rat. It is more prevalent in the East than in any part of the world, but occasionally cases appear in England, the germs no doubt being carried by rats from ships. The incubation period may vary between 2 to 10 days, but in the average case, symptoms generally appear about 3 days after invasion of the germ. Onset is generally quite abrupt, marked by a feeling of chilliness, and the temperature may rise to 103° F. or higher. The pulse becomes more rapid, the nostrils dilated, and there is severe headache and aching of the limbs. Giddiness is complained of, and the patient usually experiences a loss of muscular control causing the gait to become staggering. There may be great general weakness and marked mental apathy. In the majority of cases of bubonic plague the glands in the groin become affected, and less frequently other lymphatic glands. The bubo or swelling, which may appear on the groin, is as a rule very painful and may vary from the size of a walnut to the size of a small orange. This swelling may subside, but if suppuration takes place it is a very unfavourable sign. The tongue is coated and the mouth and gums are covered with thick saliva. The urine generally becomes scanty and there may be traces of albumin present. If a pregnant woman becomes infected with this disease, abortion generally occurs.

Death may occur at any stage of the disease; but in cases which improve, convalescence may be very prolonged. Plague is a disease with a very wide range of symptoms and which may be divided into various types. (*See also* PLAGUE.)

BULIMIA.—Bulimia is the medical name for hunger which is more extensive than it

should be. It occurs in some forms of insanity and is also a symptom of diabetes.

BUNION.—Inflammation of a *bursa* of the foot, usually in the neighbourhood of the big toe, is a very common complaint and can be very painful and crippling. It may be due simply to the pressure of badly-fitting footwear, such as boots or shoes that are too narrow or too short, but very often the big toe is already deformed by gouty heredity or arthritis and the bursa which forms to protect the joint becomes inflamed by some extra pressure. Bunions must be treated like other forms of *bursitis*. (*See also* BURSITIS.)



Bunion

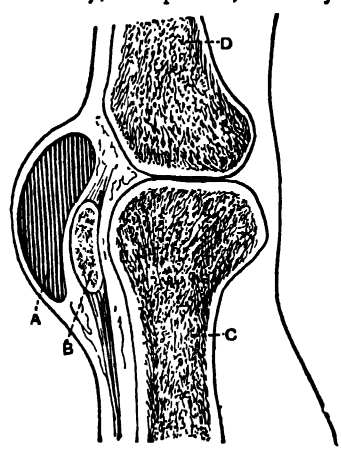
BURNS AND SCALDS.—A *burn* may be caused by dry heat, such as fire or touching a hot metal; by lightning or an electric current; by corrosive acids, such as nitric acid or vitriol; or by corrosive alkalis such as caustic potash, caustic soda or quicklime.

A *scald* is caused by moist heat, such as boiling liquids, steam, hot oil or tar. The extent of the damage varies from a mere reddening of the surface of the skin to a charring of the deep tissues. The amount of damage done depends upon the intensity of the heat, and the length of time that the burnt person was exposed to it. The chief dangers from burning or scalding are shock and blood-poisoning. Even the smallest burn is very painful. The treatment of a burn or scald is always a first-aid treatment, as the sooner the burn can be covered up the better. Therefore the subject is dealt with more fully in the SUPPLEMENT ON FIRST-AID TREATMENT.

BURSA.—A small enclosed sac containing clear sticky fluid. These little bags of fluid are found in various parts of the body where two parts would rub on each other. They are placed between the parts to minimize the results of friction. The most usual situation in which they are found is therefore round joints. Bursæ are liable to injury and inflammation.

BURSITIS.—Inflammation of a bursa is known as bursitis. In acute inflammation the bursa becomes distended with fluid, and the tissues in the neighbourhood become swollen, hot and red. The treatment is similar to that of an acute abscess, hot fomentations and rest being necessary. If pus forms in the bursa it must be let out. In certain occupations the bursa in a particular region may be subject to repeated irritation and a condition of bursitis may become chronic. The commonest forms of chronic bursitis are "housemaid's knee," "miner's elbow" and "weaver's bottom." One form of "tennis elbow" is a bursitis. In these chronic forms of bursitis the movement which causes the irritation to the bursa must be avoided and the part rested. Iodine painted on over the region of the bursa will help to reduce the swelling, and an elastic bandage for support may be very useful.

Persons who habitually carry weights in the same way, like porters, are subject to bursitis in various parts of the back and shoulders. The form which is common amongst the porters at Covent Garden is called a "hummy."



Bursitis: Housemaid's Knee
A. Prepatellar Bursa B. Patella
C Femur D. Tibia

BUTTER.—Butter is a very valuable part of the daily diet, and has been in use since

very early days. Nowadays the manufacture of butter is a highly skilled proceeding undertaken usually under the supervision of expert chemists and bacteriologists, and butter exposed for sale must conform to certain standards laid down by law, and usually reaches the public in as pure a form and as clean a manner as is possible with a foodstuff produced in such large quantities. A good standard of milk is required. The cream is separated from the milk and is pasteurized to kill undesirable germs. It then has the proper organisms added to it in order to acidify it, and when they have ripened it suitably the churning process takes place. After churning the salt is added and it is done up into packets.

As a food, butter contains a large proportion of the fat soluble vitamins A and D, and is therefore especially valuable for children who are still growing, since vitamin A influences the general growth of the tissues and vitamin D the growth of the bones and teeth and if sufficient is not taken in the food its absence will lead to rickets. If, therefore, only a limited amount of butter can be bought by the household it is much more valuable to the children than the adults, who can obtain the fatty food they require from margarine, which contains vegetable oils but not vitamins. Nut butters are not butter at all and should be classed with margarine.

The only substitutes of value for butter in the dietary are milk in quantity and cod-liver oil. (*See also* SUPPLEMENT ON DIET AND INVALID COOKERY.)

BUTTERMILK.—Buttermilk, or the liquid left after extracting the butter from cream, is a healthy cooling drink; it has a definite value in certain cases of gastric disease.

BUTYRIC ACID.—An acid with a sharp, bitter taste which is contained in butter. This acid may form in the stomach owing to indigestion, and its presence generally imparts a very unpleasant odour to the patient's breath.

BUXTON.—Buxton is a popular spa and hill resort which is much recommended for people who want spa or convalescent treatment in bracing surroundings. It is the highest spa in Great Britain, being situated at an altitude of 1,000 feet in the beautiful mountain district in Derbyshire known as the Peak District. There were Baths there in Roman times, and in the days of Queen Elizabeth they became very fashionable again. The chief source of the waters is St. Ann's Well, which consists of nine springs of warm water. This water resembles that of Bath in type, and is prescribed for the same diseases. As well as St. Ann's Well there is a spring of water containing iron, which has the advantage over the water of some of the other iron-water spas that it does not cause dyspepsia nor constipation. It is particularly useful for dyspeptic persons who are also anæmic, for anæmic children and for eye diseases due to weakness of the eyes. (*See also* BATHS; ELECTRICITY.)

CACHEXIA.—This term comes from two Greek words meaning a bad habit. In medicine the term is applied to conditions in which there is much wasting and general loss of flesh, due to some serious disease such as tuberculosis, cancer or syphilis.

CADAVER.—Cadaver means a dead body, but it is applied especially to the dead body of a human being.

CÆCUM.—The cæcum is the first part of the large intestine or bowel. It forms a large pouch with its closed end pointing downwards and its open end communicating directly with the colon. Its average size is about 2½ inches long and 3 inches broad. The appendix is attached to the cæcum. (*See also* INTESTINE.)

CÆSAREAN SECTION or OPERATION.—This is an operation by which the child is removed from the mother's body through an opening which is made in the abdominal wall. It is frequently necessary to carry out this operation in cases where the child cannot be born in the natural way without endangering the life of the mother. Obstruction caused by tumours, or deformities of the pelvis may make this operation necessary. The death-rate from Cæsarean section is very small, and if it is properly carried out no serious complications are likely to arise. This operation, in many cases, may save the mother and

also the child from serious injury and even from death. It gained its name from the fact that Julius Cæsar was born in this manner.

CAFFEINE.—This powerful substance is found in the leaves and beans of the coffee tree and in the leaves of common tea. In character it is slightly bitter to the taste, and is composed of colourless, silky crystals which melt easily in cold water. Excessive tea drinking may cause indigestion, but this may be due to the tannin in the tea and not to the caffeine. It is a well-known fact that tea and coffee are stimulants and increase the mental activities, but very excessive indulgence may cause trembling of the muscles and "nervousness."

In bronchial asthma, caffeine citrate may be given before bedtime and during the night. It is useful in dropsy due to kidney disease, heart failure in pneumonia, nervous headache, and also in cases of diarrhœa. For cases of chlorosis, caffeine may be given together with digitalis. Effervescent caffeine citrate with potassium bromide is a very excellent remedy for the treatment of severe headache, and cold tea applied locally to the eye has been found very soothing.

CAISSON DISEASE.—This is a condition which occurs in divers, and in others who work under high atmospheric pressures. Symptoms do not develop until after the diver returns to normal atmospheric pressure.

Symptoms.—In the mildest forms there is headache, also giddiness and fainting which may pass off without any ill effects. In the more severe cases there are agonizing pains in the limbs, joints and trunk, known by the workmen as "the bends," from the position in which the limbs are held. Abdominal pain and distension, with nausea and vomiting may be due to escape of gas into the intestines. There may be complete paralysis. In severe cases there is vertigo and rapid coma, and death is not uncommon. As a rule, the milder forms, including the "bends," generally recover without any permanent ill effects. Even cases of complete paralysis may recover in a few days, though usually improvement is more gradual.

Fat men should not be employed as caisson workers as they are more liable to be affected than others. In order to prevent the occurrence of this disease the workers should pass from the atmosphere of very high pressure to the normal one by means of a series of air-locked chambers, where the pressures are gradually lowered, staying a definite time in each chamber. By means of this gradual change of pressure the tissues are able to adapt themselves and so return to normal without any harmful effect on the worker.

Treatment.—When symptoms of caisson disease do occur, the patient should be placed in a chamber and the atmospheric pressure raised to that at which he was working. He should then be very gradually brought back to the normal atmosphere.

CAJUPUT OIL.—A transparent, pale bluish-green liquid with a strong penetrating odour. The oil is distilled from leaves of certain plants grown in Batavia and Singapore. Used externally, it is a stimulant and irritant and is often rubbed into the skin in the treatment of chilblains, rheumatism, and chronic inflammation of the joints. The only objection to it is its rather strong smell. It is occasionally given internally in cases of dyspepsia. It may be combined with other remedies or may be taken on sugar. It is the chief ingredient in the well-known French medicinal oil called gomenol.

CALABAR BEAN.—A powerful drug known as physostigmine or eserine salicylate is obtained from the calabar bean. Physostigmine applied locally to the eye causes the pupil to contract and is used extensively by oculists in the treatment of certain eye disorders, especially glaucoma. It has been given internally for chronic constipation, and chronic bronchitis when there is not enough expectoration. Given in large doses this drug acts as a poison and death generally takes place from asphyxia.

CALAMINE.—The natural zinc carbonate when washed and pulverized forms a smooth powder which is known as calamine. It is an excellent drug for skin diseases and may be made up as a lotion, or prepared with vaseline and used as an ointment.

CALCIUM.—Calcium is best known as quicklime, limestone or chalk. Calcium chloride is used to increase the clotting power of the blood. It may be given by injection into the muscles to gain a quick effect. To arrest intestinal bleeding, 30 to 60 grains daily have been given internally, accompanied by rectal injections containing 60 grains to two pints of water. It is employed in itching skin affections such as urticaria, pruritis and

prurigo. It is useful in chilblains, small doses being taken frequently. Calcium carbonate and calcium phosphate in equal parts, a teaspoonful thrice daily, is an excellent remedy for diarrhœa of gastric origin. Calcium carbonate is extensively employed in conjunction with magnesium compound in the treatment of gastric and duodenal ulcer. Lime water is used in the preparation of milk for infant feeding, as it reduces the size of the curds; 1 to ½ teaspoonful should be used. Lime water may be taken by adults in doses of 1 to 4 fluid ounces for acidity of the stomach or to check looseness of the bowels. Warts on the back of the hand are stated to be cured in a week by half a pint a day.

Used externally the prepared chalk of calcium may be used as a dusting-powder. Calcium mixed with equal parts of linseed or olive-oil is well known as Carron oil, after the famous Scottish ironworks where it was first used. This is applied to burns, but tannic acid is now thought to be a better remedy.

CALCULUS.—Calculus is the term applied to a stone-like material found in the body, particularly in cavities of the body. These stones or *calculi* usually form in the bladder, kidneys, ureters and sometimes in the pancreas. The formation of the stone may be due to various substances cemented together such as uric acid, phosphates or calcium. Generally there is an original cause such as infection, a foreign body, remains of blood-corpuscles or fatty tissue. The calculi vary greatly in shape and may be sand, gravel or stones, according to size. So long as the calculus stays in the cavity in which it has formed it may give rise to no symptoms whatever, but immediately it begins to pass out from the cavity intense pain is generally set up. (*See also* GALL-STONE.)

CALLUS.—A callus or callosity, like a corn, is a thickening of the horny layer of the skin, sometimes to many times its normal size; but unlike a corn it has no core and merges gradually into the surrounding skin. Callosities are yellowish-brown in colour. They are due to friction combined with pressure, and may be found on the feet or hands.

Treatment.—On the feet they occur when badly-fitting shoes are worn; not only shoes that are too tight, but those that are too loose can produce callosities, following blisters due to the constant friction. The remedy here is obvious. They also occur in some deformities of the feet where one part of the foot has to take all the pressure. In these cases (unless operative treatment can put matters right), it is best to take the advice of an orthopædic surgeon (who is skilled in curing deformities) as to the type of foot-wear necessary. As a simple instance, flat-foot, amongst its other troubles, is frequently accompanied by a troublesome callus under the head of the middle toe; this is very much relieved by shoes made specially for the condition. The expense of these is very little greater than that of ordinary good shoes. It will generally be found that with properly fitting shoes, calluses gradually disappear, but if any further measures need to be taken, the treatment described under CORNS will be found suitable. It is, naturally, far easier to remove a callus, as here there is no troublesome core. Some patients find an ordinary ring-pad, such as is used for corns, useful when the callus is small; or a sock of *spongiopiline*, with a hole cut out opposite the callus, is very helpful as a means of temporary relief. A swelling called a bursa may form beneath a callus, and if it becomes inflamed, may be a very troublesome complication, causing much suffering. If neglected, it discharges through the skin and an inflamed passage remains, resembling an ulcer of the foot.

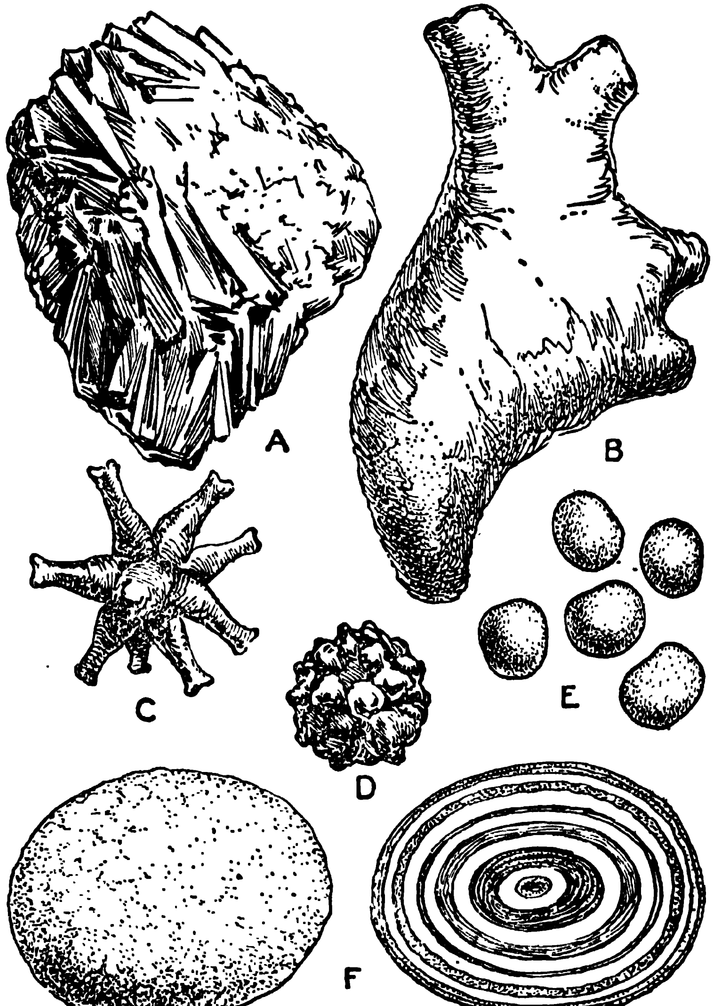
Calluses are also seen very frequently on the hands, most commonly on the "pads" at the base of the fingers. They are seen in athletes such as rowers, cricket- and tennis-players, or gymnasts; and are produced by various trades, labourer's, blacksmith's and so on. Harp and other wire-stringed instrument players show some degree of callus at the ends of the fingers, where their "trade-pressure" occurs. Chemical injuries occurring frequently in the course of work, such as with acids or brine, frequently produce calluses.

As on the feet, calluses form on the hands as a kind of natural armour, to protect against irritation, and usually give no trouble except that they are unsightly. It is best to leave them alone unless the person is prepared to give up his work or his games, as more harm than good would be done by removing a protective layer and continuing to expose the skin to irritation. They have, however, the disadvantages that the sense of touch over the affected parts is diminished; and also that in the dry and horny skin, cracks not infrequently occur, which penetrate to the true

skin and become very painful. The treatment for these is mentioned under CHAPPED HANDS AND LIPS.

CALOMEL.—Mercurous chloride, more commonly known as calomel, is a heavy white powder used as a purgative. It is a useful remedy for an overloaded liver and for dyspepsia generally, though some people find it rather upsetting or depressing. It should be given at bed-time, and be followed by a morning glass of salts. Calomel is often dusted on ulcers or sores, especially if they are of syphilitic origin. (*See also* CHOLAGOGUE.)

CALORY.—Calory is the name given to a heat-unit; the amount of heat required to raise the temperature of one kilogram of water from 0° to 1° C. In special diets the amount of food eaten is carefully measured out in calories. (*See also* SUPPLEMENT ON DIET AND INVALID COOKERY.)



CALCULI

A Oxalate (Crystalline type)
B Phosphatic from Pelvis of Kidney
C and D. Calcium Oxalate (Mulberry)
E Small Calculi from Bladder
F Mixed Uric Acid and Calcium Oxalate (external view of section)

CALUMBA.—The root of the Jateorhiza palmata is imported from the forests of South Africa and parts of the East Indies. It is an excellent example of a simple bitter and may be prescribed with salts of iron. It is useful in dyspepsia and may be given as a mild, appetizing tonic in convalescence. (*See also* BITTERS.)

CAMOMILE.—The flower-heads of Anthemis nobilis, the properties of which are



Camomile

due to an oil, camphor, and a bitter substance it contains. It is useful in coughs and for infantile colic. A large cup of boiling water is poured over about a dozen of the flower-heads and left by the side of the fire to infuse for 10 or 15 minutes. The infusion is then strained, sweetened and served hot. The infusion of anthemis may be obtained from a chemist. Camomile is also extensively used as a hair-wash. (*See also* SUPPLEMENT ON BEAUTY CULTURE; TISANES.)

CAMP FEVER.—An old popular name for typhus fever.

CAMPHOR.—Camphor is a white crystalline substance obtained from the camphor laurel which grows in Formosa and Japan. Oil of camphor is of a pale yellow colour, with a fragrant odour. Camphor is powdered by rubbing it with a few drops of alcohol. Its stimulating effects make camphor a favourite ingredient in many liniments. It is constantly being used in the treatment of chronic rheumatism, lumbago, neuralgia and in the chest complaints of children. The liquid preparations with various substances added, such as thymol and carbolic acid, are excellent local remedies for neuralgia, and may be dropped into a tooth for the relief of toothache. Camphor ice rubbed into the skin is very useful for chapped hands. A mixture of camphor salicylate and sodium sulphate may be taken before meals to ward off a cold.

For the condition called arterio-sclerosis and for old people with heart trouble the continued use of camphor internally is of great value. The ammoniated liniment is used in cases of chronic rheumatism, and for sprains and other similar conditions. It is dangerous to place camphor or menthol ointment into the nostrils of an infant. Even a small quantity applied in this way may cause immediate collapse. Tablets of camphor and quinine may be taken to check catarrh and also as a tonic. Camphor and bromide may be made up into a preparation and taken in the treatment of epileptic vertigo, hysteria, delirium tremens, whooping-cough and asthma. Camphorated chalk is used as a tooth powder.

Poisoning by Camphor. Symptoms.—Large doses of camphor may cause excitement, giddiness, staggering, and in some persons a feeling of exhilaration similar to the effect of alcohol is felt. In severe cases the pulse generally becomes much slower, there may be severe pains in the stomach and head, faintness, delirium, violent convulsions, and finally death from collapse.

Treatment.—An emetic should be given followed by strong tea or coffee. If the patient is unconscious strong coffee may be injected per rectum. The patient should be kept as warm as possible with hot-water bottles placed at his feet and sides and hot fomentations may be applied over the heart.

CANCER.—The human body is subject to tumour growths of various sorts. These are divided into two classes, benign growths and malignant growths. Benign growths are all the cysts and tumours which do not shorten

life. Malignant growths are those which cause a great deal of damage to the body and eventually lead to death. The general health is greatly impaired and the organ, such as the stomach or liver, in which the cancer is growing becomes less and less able to carry on its work until the day comes when it can no longer function at all. They are also apt to spread to other parts of the body and to return after they have been cut out. Malignant growths are of two sorts, sarcomas and carcinomas; but for convenience they are generally referred to simply as "cancer."

Cancer is largely a disease of middle and old age but does sometimes occur in young people. When younger people are attacked by cancer it usually runs a much quicker course than in older persons, and may be considered an acute disease. In older persons, when it is discovered too late to operate upon successfully, it can still often be held at bay and alleviated for a number of years.

It is often said that cancer is a disease of civilization. It is true that there is a larger proportion of cases in the so-called civilized countries than amongst the less civilized races, but it is by no means unknown amongst native races, and as it is so much more a disease of old age than of youth it is possible that in civilized countries more people are kept alive until the cancerous age. The same thing applies to the increase in the number of deaths from cancer. It is obvious that as fewer people are allowed to die from other causes, such as consumption, in these days, and more people are kept alive to the age of fifty, there must be an increase in the number of deaths from cancer until some means is discovered of curing cancer at a later stage in its course.

It may be pointed out here, however, that cure of cancer after it has taken a good hold can only amount to getting rid of the tumour by some such means as surgically cutting it out or shrivelling it up, and great damage may be done to the surrounding parts before the cancer is discovered. By far the more important thing is to prevent cancer from occurring at all, or to discover its presence at a very early stage.

Different kinds of cancer.—The difference between carcinoma and sarcoma is one of the character of the cells of which they are composed. The whole human body is composed of millions of cells. These cells are described in a separate article and it is sufficient here to state that the life of a cell in the body is like the life of the body itself. The cell begins, grows and develops and finally dies and is succeeded by other cells. Like bodies there are normal cells and abnormal cells, that is, well and sick cells. There are also cells of different types, like people of different races. The two most important groups of cells are first the group containing the cells forming the skin, the linings of the mouth and various organs and passages of the body and the glands. The other group consists of the cells forming the connective tissue or generally the flesh; and the tissue composing such parts of the general framework of the body as the bones, muscles and gristle. A malignant growth of the first group of cells is called a *carcinoma* and of the second group a *sarcoma*. Both sorts of growth are popularly grouped together and called *cancer*.

Of carcinomas and sarcomas, the carcinomas are by far the more numerous and are the more dangerous. Sarcomas develop in the tissue surrounding bones, muscles, etc., whilst carcinomas attack glands, organs such as the stomach, and soft parts like the lip, and the skin itself. Skin cancers are called epitheliomas, and are described separately under the headings CANCER OF THE SKIN and EPITHELIOMA.

As well as the breast and womb, stomach and rectum, which are the most frequent sites, cancer is found frequently in the intestines, gall-bladder, liver, larynx, tongue, œsophagus (the passage from the mouth of the stomach) and in bones. Cancer of the skin, and epitheliomas (including smoker's cancer) are described separately under their own headings.

Occupational Cancers.—Certain occupations have a greater risk of cancer than others, and in these cases the cancer is almost certainly due to constant irritation of a part either directly, or as the result of a frequently used chemical substance. For example, in the Lancashire cotton-mills male workers get a form of cancer called mule-spinner's cancer. This cancer arises in the scrotum and is due to constant irritation of the part by the constant saturation of the clothes with the lubricating oil used. Precautions are now taken to prevent this form of cancer. Chimney-sweeps, and gardeners to a very small extent only, are also liable

to cancer of the scrotum and cancer of the skin, due to the soot they work amongst. Workers with rubber may get cancerous growths on the skin, and all workers with tar products, such as creosote, benzine and paraffin are liable to cancer. (*See also* CANCER OF THE SKIN.)

What Cancer is.—It is not known what causes cancer, but the effect of whatever causes it is to make groups of the cells which make up the skin, the lining of organs of the body or the glands, grow in an irregular fashion. The tissues of the body, which include everything except bone, fluids and oddments like nails and hair, are made up of living cells which grow in a definite manner, are destroyed and repaired all in an orderly fashion. In the normal person, when cancer invades the body from its unknown source, certain of these cells begin to grow in an unusual manner. They grow more quickly, are imperfect in form and are arranged differently. They become more powerful than the normal cells around them and begin to destroy them, feed upon them and eat them up as it were. From a small lump the tumour grows until the whole cavity of the organ it has attacked is filled up and the organ is of no further use.

Causes of Cancer.—The causes of cancer are as yet unknown, except that constant irritation of a part seems to be directly responsible for a certain number of cancers, such as the trade cancers. Why this should be so is not known. In the case of cancer of one of the internal organs, such as the stomach or intestines, cancers seem to arise on the site of old, standing inflammations such as chronic ulcers, and in cases where chronic poisoning of the body by toxins and abnormal germs has been going on for a long period of years, thus causing the part to be thoroughly unhealthy. Some authorities think that under-nourishment of the body in respect to vital substances like vitamins opens the door to cancer. A blow on a soft part such as the breast may be quickly followed by cancer. It is thought by some workers on the subject of cancer that there may be a definite cancer germ, which like other germs gains admittance to the body and settles in a weak spot, and in 1925, Dr. W. E. Gye and Mr. J. E. Barnard were able to photograph living organisms which they found present in cases of both carcinoma and sarcoma. Other workers, however, were unable to confirm their observations. They are continuing their researches into the causes of cancer in company with a great band of skilled medical research workers all over the world, who are working under such bodies as the Medical Research Council, the Cancer Research Fund and the British Empire Cancer Campaign. Much work also is being done in the great hospitals and in private laboratories. It would seem that it is only a question of time until the cause of cancer is known and then its prevention and cure by medical means may become comparatively simple.

Early Diagnosis of Cancer.—At present operation in the early stages is the only certain cure. It is therefore very important that cancer should be diagnosed as soon as possible and that operation should be performed at the earliest possible moment. This is unfortunately, often a difficult matter, as there is very little to attract the victim's attention to the cancer in its early stages. Pain is not an early symptom in most forms, and quite a large cancer will grow without causing any noticeable pain whatsoever. A lump may be noticed in the breast, but in the deep organs of the body the tumour has usually reached a large size before it is felt. Indrawn nipples or dermatitis round the nipple may be the first symptom noticeable of cancer of the breast. In the majority of cases the first thing that draws attention to the cancer is that it has begun to interfere with the working of some organ, and the patient goes to the doctor complaining of some such trouble as indigestion, difficulty in breathing, difficulty in swallowing, or irregular discharges and bleeding from the womb; or increasing weakness and tired feelings and loss of weight may be the most noticeable symptoms. It will be seen, therefore, that it must be necessarily difficult to get cancer patients in an early enough stage, unless people are encouraged to have periodical medical examinations, and are brought to see the folly of neglecting even small symptoms of ill-health when they begin after the age of forty in persons who have previously been strong and healthy. Even more difficult is the case of persons who have been accustomed for years to a slight degree of ill-health, such as chronic nervous dyspepsia or irregular actions of the

bowels. These people frequently do not notice themselves at what point their chronic discomfort turns into permanent and definite disease until it is perhaps too late.

In connection with the early diagnosis of cancer it seems likely—though at present it is not definitely proved—that there may be early changes in the quality of the individual's blood when cancer is beginning its attack. Working on these lines, Dr. Bendien of Holland invented a blood-test which seems to be along the right lines, and some interesting results have been obtained with these tests in a modified form by the English pathologist, Dr. Cronin Lowe. These blood-tests seem to give definite hope that before long it may be possible to discover whether a person has cancer in an early stage.

Cancer in Women.—It is generally known that more women are attacked by cancer than men. This is because the reproductive organs play so much larger a part in women than in men, and the womb and breasts are very liable to cancerous growths. Besides actual irritation to these parts, there is the additional upset in health which is caused to many women by their unsatisfactory manner of living. With the best intentions in the world it is in very many cases impossible for married women to get sufficient exercise, rest and fresh air. The cares of a house and family mean, for many women, that for their child-bearing period and until the family grows up, their own health and comfort must take a secondary place. Hence the great frequency of the tragedy where the mother, having seen her family grow up successfully, begins to take notice of her own vague pains and discomforts only to find that it is too late.

Is Cancer Infectious?—There is no evidence that cancer is infectious, though it often happens that several members of the same family die of cancer. Nor can it be proved to be hereditary, though children of cancerous parents may frequently die of cancer. It is much more likely that in both cases it is the same faulty hygiene, diet, and manner of living, together perhaps with some similar weakness of constitution which is shared by different members of the family, which is responsible for cancer in members of the same family.

Treatment of Cancer.—As has been said previously, the only successful treatment for cancer at present known is complete removal at an early stage by operation, and as so much depends upon the earliness of the operation, not an unnecessary day should be wasted after the diagnosis has been made. Some authorities prefer treatment by "deep" X-rays or radium as a means not only of slowing the growth and rendering the patient more comfortable, but actually of cure, though operation has the most advocates. Radium treatment does better than operation, however, in some cases such as cancer of the tongue. The truth is that both radium and X-ray treatment do very well in early cases of cancer, but one does not know yet how long such cures last and operation is more certain, at any rate, up to the present, so the patient should choose the safer course. In late cases of cancer where little can be done but perform "palliative" operations to make the patient more comfortable, a great deal can be done by X-rays and radium to relieve the patient of some of his miseries; even in those cases where a cure is impossible the skilful administration of pain-deadening drugs will render the latter stages more bearable both for the patient and for his family and friends. (*See also* BREAST, CANCER OF; CANCER OF THE SKIN; EPITHELIOMA.)

Euthanasia.—In this connection it may be mentioned that there is nowadays much discussion as to the possibility of making euthanasia legal. By euthanasia is meant the procuring for the sufferer from cancer or other incurable diseases, an easy and calm death by artificial means, in blunt language, painlessly putting to death persons who have painful incurable disease. There are, however, many difficulties in the way, moral and legal, and there is little doubt that the permission would be abused in many cases.

Secondary Cancer is a cancer that follows on from cancer of some other organ, and may spread thence by direct growth or by means of the lymph channels. Both these processes are very well seen in long-standing cancer of the breast, where not only the substance of the breast, but also the overlying skin has become affected, showing firm nodules or little knobs of growth, which finally break down into cancerous ulcers, and the lymph glands under the arm and about the collar-bone on the affected side become enlarged and firm, showing that they, too, are infected with, and may spread the disease.

CANCER OF THE SKIN.—The skin, like every other part of the body, is afflicted with tumours or "new growths." These may be divided, for convenience of description, into



Cannabis Indica

the harmless or *benign* growths, which cause no risk to life, but may be disfiguring or troublesome from their size or position on the body; and the harmful or *malignant* growths, which, if unchecked, will inevitably cause the death of the patient, just as does a malignant growth in any other part. They are all familiarly called "cancer of the skin," though there are several varieties which begin in different ways.

Cancer of the skin arises from an overgrowth of a group of the cells making up the skin tissue. For some reason, these begin to grow rapidly, using the neighbouring healthy cells for food, and often spread to other parts: in short, they behave like an invading army of lawless marauders—an army that is too often, alas! victorious over the law-abiding body cells.

CANCRUM ORIS or CANKER OF THE MOUTH.—This is a disease of the mouth which generally appears in childhood between the ages of one and five. The patient is usually in a very debilitated state owing to some such disease as measles, diphtheria, scarlet fever or whooping-cough. Deep, foul ulcers appear on the inner side of the cheek and may spread rapidly and pierce through the cheek. The gums and lips may be similarly affected. The temperature is usually very high, and in cases where there is general blood-poisoning or broncho-pneumonia the patient may even die. The disease is due to germs and to poor hygienic surroundings. An intramuscular injection of sulpharsenol is usually given by the doctor.

CANITIES.—A term applied to blanching or whitening of the hair. (*See also* HAIR.)

CANNABIS INDICA.—Cannabis Indica is an Indian hemp from which a powerful drug is obtained, which is also known as *hashish* or *bhang*. The drug is obtained from the dried flowering tops of the plant Cannabis sativa from which the resin has not been removed. It acts as an antispasmodic, and a narcotic or sleep-producing drug. The effects of this powerful drug generally make their appearance about half an hour to two or three hours after administration, if it is taken before a meal. If it is taken after a meal, no results may be felt for about six hours. The patient may have a sensation of mild intoxication, feeling very gay and pleased with everything. Pleasant ideas pass through his mind and he finds himself able to say witty things with wonderful ease. He loses all sense of time and minutes may extend to days in his dreams. As a rule, the patient quickly forgets his dreams, but sometimes the memory of them remains after recovery. On awaking from his deep sleep, the patient generally feels refreshed, but his surroundings may appear unreal for an hour or so. This drug is used extensively in the East, and when it is taken in moderation it causes no harm. When taken to excess it leads to loss of appetite, trembling of the limbs, and insanity; but very large doses have been recovered from, and no death from cannabis indica is on record.

It is used in medicine in the form of a tincture or of an extract, and may be administered in cases of neuralgia and migraine. It is also useful in the treatment of colics, whooping-cough, and painful menstruation.

CANNULA.—A tube used for withdrawing fluids from the body. A double cannula is



Cannula, with Trocar

used to wash out a cavity of the body: one tube being used for the inflow of a fluid and the other tube for the outflow.

CANTHARIDES.—Cantharides is obtained from various species of beetles

known as Spanish Fly or of Mylabris. It contains a powerful poison called cantharidin. Cantharidin is very largely used to raise a blister, and it is of all drugs the most commonly used as a counter-irritant. In rheumatoid arthritis counter-irritation is sometimes useful and Cantharides plasters may be employed, or cantharidin ointment and tincture of cantharidin. Cantharides should not be applied to any part on which the patient lies, or a bedsore may form, and it ought not to be applied to paralysed limbs. The plaster should not be left on after the blister has formed, and after the blister has burst, some bland ointment should be applied. It is used externally in pleurisy, pericarditis, meningitis, and neuritis.

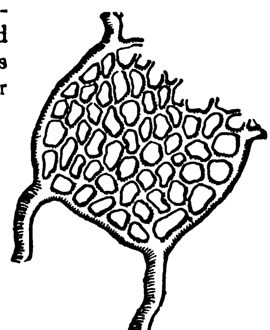
Cantharides may be given internally in cases of dropsy due to heart disease, in order to increase the amount of urine passed. Solutions of cantharidin, as well as other preparations of cantharides, are employed for stimulating the growth of the hair, in alopecia, and to prevent its falling out. The following prescription may be used:

Acetum cantharidini	$\frac{1}{2}$	fluid ounce
Glycerine	$\frac{1}{2}$	„ „
Spiritus rosmarini	$\frac{1}{2}$	„ „
Water	5	ounces

Poisoning by Cantharides.—Cantharidin may be absorbed by the skin in sufficient quantity to produce internal effects, or symptoms of poisoning may arise through improper administration of the drug. When taken internally it produces burning in the throat, difficulty in swallowing, and the patient may suffer from severe abdominal pain, bloody diarrhœa, and vomiting. Cantharidin is absorbed into the blood and may cause much irritation of the urinary tract. This drug should never be given either internally or externally to patients whose kidneys are not in a healthy state, nor to elderly patients or debilitated children. Treatment requires medical attention, but in the meantime, the patient should be kept warm, and water and barley water may be given freely.

CAPILLARIES.—The tiny blood-vessels of the body are called *capillaries*. They continue the circulation of the blood between the smallest arteries and the smallest veins, called the *arterioles* and the *venules*, and are so small that they cannot be seen with the naked eye. The capillaries form dense networks throughout the tissues of the body. They are thickest in size just under the skin, and smallest in the linings of the organs deep in the body, and in the brain. The number of capillaries in any given organ depends upon the need of that organ for blood. The denser the network of capillaries the greater is the supply of blood.

The structure of the capillaries is interesting. They consist of walls made up of a single layer of cells whose margins are joined together with a cementing substance. The capillaries branch out from the walls of the arteries and veins, and from the arteries they obtain their supply of blood which has taken up oxygen and nutritive blood. The walls of the capillaries have the characteristic of being able to pass oxygen, carbonic acid and nourishing materials from the blood through their walls into the tissues for the purpose of feeding the tissues, whilst similarly the capillaries can collect waste materials out of the blood which they return to the veins for destruction and excretion from the body. The white blood-corpuscles or leucocytes, which protect the body by attacking disease germs which have found their way into the bloodstream, are able to pass through the capillaries, backwards and forwards between the blood and the tissues. (*See also* Artery; Blood; Leucocytes; Veins.)



Capillaries

CAPSICUM.—Capsicum is also known as Guinea pepper or Pod pepper. The dried ripe fruit of the plant when powdered is called red or cayenne pepper. It is used in medicine in the form of an ointment or tincture. The ointment is used as a counter-irritant and may be useful in the treatment of chest affections, rheumatism and sciatica. The tincture of capsicum, when given internally, may increase the flow of saliva and gastric juice. It thereby relieves dyspepsia and is believed to allay the craving for alcohol. Wool may be soaked with capsicum and used in rheumatic affections, bronchial and similar painful complaints where warmth gives relief. (*See also* Chilli Paste.)

CARAWAY.—This is the name of the dried ripe fruit of the Carum carvi. The fruit yields an oil with an aromatic odour and a spicy, pleasant taste. The oil is used in medicine and as a flavouring agent. A few drops may be taken as a means of soothing an irritated stomach.

CARBOHYDRATE.—One of the largest and most important groups of substances from which the body obtains its food is the group of carbohydrates, which are so called from the fact that they contain carbon, hydrogen and oxygen, all of which are necessary to the maintenance of health. Of these three elements, carbon is the means by which the energy and heat of the body are provided for. In the body it is burnt up, producing heat and energy. It follows, therefore, that at different times the body will require different amounts of carbohydrates. In winter more will be required than in summer, and the individual who has to perform much physical exertion will need more than the person who leads a sedentary life. The labourer will need more than the clerk. This is well seen by the craving that athletes often have for sweets or sugar after an outburst of strenuous exercise. (*See also* DIGESTION; FOOD; SUPPLEMENT ON DIET AND INVALID COOKERY.)

CARBOLIC ACID.—Carbolic acid or *phenol* is obtained by distilling and purifying coal-tar. It may be obtained as colourless crystals with a peculiar smell and a sweetish, pungent taste. When they are treated with about 6 per cent. of water these crystals become fluid and are carbolic acid as we know it. Carbolic is a powerful caustic and irritant, and when applied to the skin in concentrated form will cause burning and pain. A white spot may appear on the part, which becomes red when the acid is removed. Externally, carbolic is largely used as a deodorant and disinfectant. The raw acid may be used for disinfecting drains, bed-pans, etc. A weak solution is used to wash wounds to keep them antiseptic, and mosquito bites may be relieved by the application of weak carbolic. It is also useful in keeping the mosquitoes away. Carbolic cleanses, heals, disinfects and allays pain. It is very suitable as a gargle used in a weak solution. Because of its deadening effect a strong solution will relieve itching from any cause. Carbolized gauze and carbolized lint are also prepared and used frequently for dressings for wounds.

Poisoning by Carbolic Acid.—Carbolic acid may be absorbed through the skin and mucous membranes. Poisoning has often occurred as a result of the prolonged use of carbolized dressings, or if taken internally in large concentrated doses. Immediately on swallowing, an intense burning pain may be felt in the mouth, gullet and stomach, and white ulcerated areas may appear in the mouth. The skin becomes cold and clammy, and breathing gradually becomes more and more feeble and finally stops. Treatment consists of washing out the stomach several times with 10 per cent. alcohol and water. Apomorphine is a suitable emetic. White of egg, and large doses of any harmless oil may be given. Chalk and lime water and caffeine are also antidotes. The patient must be kept as warm as possible by the use of hot-water bottles or electric pads. Medical aid should be called in as early as possible.

CARBON MONOXIDE.—Carbon monoxide is a very poisonous, odourless gas. It is the dangerous gas given off from the exhaust of a motor-car or from a geyser in a bathroom. In extreme cases death may occur very quickly and artificial respiration may prove of no avail, owing to the difficulty of separating the gas from the blood. The presence of this gas is very treacherous in coal mines, as miners may go on working in a poisoned atmosphere without being aware of it. Many people who have gone to sleep in a room heated by charcoal braziers, or having otherwise breathed air overcharged with carbon monoxide, have gradually become unconscious and died from the poisoning.

When entering a room filled with gas in order to rescue a person, the mouth and nose should be covered with a damp cloth and the windows should be thrown open immediately. On no account should a naked light be used. The person should be dragged or carried out into the fresh air and the clothing loosened as much as possible and artificial respiration started. The doctor should be called as soon as possible and inhalation of oxygen gas should be given when necessary.

CARBONIC ACID.—Carbon dioxide is a gassy product commonly known as carbonic-acid gas or carbonic acid. This gas must be given off by the body if health and life are to

be continued. Any atmosphere which is overcharged with carbonic acid may produce symptoms of headache, loss of appetite and lack of energy. When it is inhaled in a pure form, death results from asphyxia. It is of great value if breathing is difficult in the new-born child, and it has been given to stimulate the breathing in cases of opium poisoning and pulmonary collapse.

Carbonic acid snow may be made from the gas which has been allowed to escape from a cylinder into some suitable receptacle or tube. The snow can be moulded so as to form a pencil, which may be applied to birthmarks, port-wine stains, lupus or rodent ulcers. The application is usually for about half a minute or a little longer. (*See also* ANÆSTHETICS, LOCAL.)

CARBUNCLE.—A carbuncle is an inflammatory condition of the skin and tissues under the skin, and is usually due to infection by a germ known as the staphylococcus. The carbuncle usually starts as a simple boil or group of boils, often at the root of a hair on the skin, but it rapidly spreads to the tissues around and under the original boil and may become very large. Occasionally it spreads inwards and downwards and may burrow in any direction. The carbuncle forms a hard, round swelling which is dark red in colour and very hot and tender to the touch, and painful. Pus forms at several points, and if the carbuncle is left without proper attention the skin may become riddled with sinuses and the whole region may become a soft, boggy mass of pus and dead tissue, which will leave a very unsightly hole when the carbuncle finally heals up. In cases that are at all severe the patient becomes very ill with a high temperature, rapid pulse rate, constipation and furred tongue. There may be severe poisoning of the system, causing restlessness and loss of sleep and perhaps delirium. The condition may rapidly become dangerous to life, especially in elderly or debilitated persons. Cases where there are two or more carbuncles at the same time, or where the carbuncle is on the lip or face or behind the ear, are especially dangerous to life.

Treatment.—The treatment is, in the less severe cases, the same as for a boil. Hot applications, such as antiphlogistine or poultices, should be continued until the matter comes to the surface, when it may be allowed to escape through small incisions, while the wound is sprayed twice daily with hydrogen peroxide to remove the dead tissues, and is dressed with boracic fomentations. As soon as the condition is recognized, injections of manganese or a vaccine should be given and the general condition should be toned



Carbuncle

up in every possible way. The diet should be generous, and a tonic should be given. Alcohol in such forms as sherry or port is often beneficial. A sleeping-draught may be given if there is insomnia. If the carbuncle is a bad one, the doctor may decide that surgical treatment is necessary.

Carbuncles sometimes occur in persons who are already suffering from kidney diseases, diabetes or chronic alcoholism, and in such cases they are apt to be especially dangerous, as the patient has not sufficient strength to throw off the effects of the poisoning in the system, which they cause. (*See also* BOIL.)

CARCINOMA.—Carcinoma is the most frequent form of cancer. It will be described under the heading CANCER.

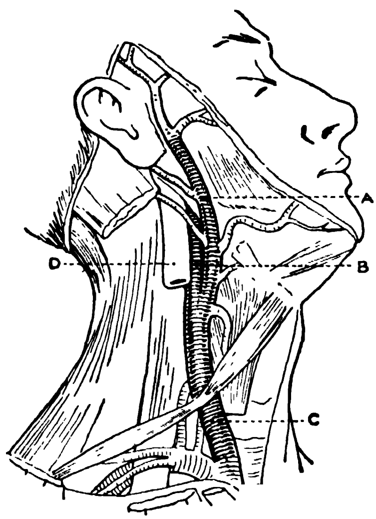
CARDAMOM.—Seeds of the cardamom plant, which is found in certain parts of Africa, are ground to obtain their oil, which has a pleasant smell and taste. The compound tincture of cardamom, in which cardamom oil is combined with cinnamon, caraway, glycerine and alcohol and which is coloured a deep rose pink with cochineal, is a very favourite flavouring and colouring matter to add to mixtures. It is also given in certain sorts of dyspepsia, to relieve colic and flatulence.

CARDIAC.—An adjective meaning anything to do with the heart, as for instance, cardiac weakness, cardiac murmur or cardiac stimulant. The heart and its diseases will be described under headings beginning with HEART.

CARIES.—The term caries means decay, and is usually used in connection with decay

of teeth, or bones. The cause of the decay in bone may be inflammation due to invasion by sceptic germs, to syphilis, or more often to tuberculosis. If septic organisms are present there will be a discharge of pus or matter. Dental caries is quite different from that occurring in bone and will be described under Teeth. (*See also* BONE NECROSIS.)

CARMINATIVE.—Any drug which produces a feeling of warmth and which relieves the feeling of over-fullness in the stomach, is known as a carminative. These drugs act by relaxing the muscles of the stomach and intestines. The taking of liqueurs at the end of a meal is a well-known example of the carminative action. The principal drugs of this class are the *volatile oils*, some of which act more powerfully than others. Those which act chiefly on the skin are oil of turpentine, cade, camphor, menthol, oil of mustard, oil of cajuput, oil of eucalyptus, arnica flowers, and myrrh. Oil of peppermint may be taken internally for the relief of flatulence. Other examples of carminatives are aniseed, allspice, cloves, cinnamon, bitter orange, and dill. Dill water is a common carminative for children and it is greatly used to cover the taste of sodium salts.



Carotid Artery:
A External Carotid C Common Carotid
B Internal Carotid D Jugular Vein

CAROTID ARTERY.—The two great arteries down each side of the neck are called the carotids, or common carotids, and by them blood is carried to the head and neck. The left common carotid artery rises from the *innominate artery* where it forks off from the *aorta* just behind the junction of the breast-bone and collar-bone. It travels upwards until a point at the level of the larynx or Adam's apple is reached, when it divides into two branches, the *external carotid* and the *internal carotid.* The right common carotid artery rises from the uppermost part of the *arch of the aorta* and travels upwards to the same distance as the left common carotid where it also splits into the right external and internal carotid. The external carotids supply the scalp, the face and the greater part of the neck, while the internal carotids feed parts within the skull and the cavities which contain the eyes. Aneurysms of the carotid artery are not often met with, but when they do occur they press on the windpipe and larynx and cause great breathlessness and sometimes difficulty in swallowing. (*See also* ARTERY; AORTA.)

CARRIER.—It sometimes happens that a person may have in his body harmful germs to which his blood has grown so accustomed and has developed so many *antibodies*, that they do him no harm, but may be transferred to people whose resistance to them is not so strong and who therefore become victims of the infection. These harbourers of germs are known as "carriers." In some cases they have never actually had an attack of the disease of which they carry the germs, but more often there is a definite history of an attack from which they think themselves completely cured. Germs of diphtheria or cerebro-spinal fever may thus be carried in the throat for years, and germs of typhoid fever or dysentery may be present in the stools. Sometimes the germ carried is not one of any particular disease, but may be a virulent streptococcus or staphylococcus germ which will cause severe infection or inflammation if it is conveyed to a delicate person or operation case, as sometimes occurs in hospitals where a nurse or doctor may be an unconscious carrier. Where the germ is carried in the nose or throat, the tonsils should be removed and measures taken to improve the health of these parts. Typhoid or dysentery carriers should be treated as they would be for the disease and all known carriers should be kept strictly away from cooking operations, invalid nursing or any thing by which they can spread the infection.

CARRON OIL.—Carron oil is a mixture of equal parts of linseed oil and lime water and is greatly used in the treatment of burns.

Olive-oil may be used in place of the linseed oil, and eucalyptus oil is sometimes added as an antiseptic. This oil takes its name from the Carron Iron Works in Scotland, where it was introduced. Carron oil should only be applied if the skin is unbroken.

CARTILAGE.—Cartilage, which is commonly known as gristle, is found in various parts of the body, chiefly in joints. The walls of the chest, the windpipe, the bronchial tubes, and the structure of the nose and ears are of cartilage. Most of the bones of the body develop from cartilage, which is replaced by bone as the infant grows older. This type of cartilage is called *temporary.* The cartilage in joints is called *articular* and it is of great importance in the structure of movable joints. If two bones were to rub continually against each other, they would in time wear each other's surfaces away and they would no longer fit tightly enough to make a useful joint. To prevent this rubbing, the end of each bone in a joint is coated with articular cartilage which is a pearly bluish-white colour, smooth and elastic, and serves to break the force of concussions and enable the bones to glide smoothly one against the other.

The cartilages which form the ends of the ribs where they join on to the breast-bone and the cartilage in the nose, larynx, etc., are of a stronger and tougher variety, and are liable in old age to *calcify*, that is, grow hard and bony owing to becoming pickled, as it were, in calcium salts. The cartilage of joints is subject to tuberculous disease. The cartilages become very sensitive and when the joints are completely relaxed, as at the moment of going to sleep, the cartilages lie on each other and their pressure causes sharp pain and abrupt awakening, which is one of the most distressing symptoms of tubercular disease of the joints.

Certain joints of the hinge variety have small separate pads of cartilage, each of which is called a *meniscus.* These menisci are easily dislocated and cause pain and loss of power in the joint until they are replaced. The commonest of these dislocations are those of the semi-lunar cartilage of the knee and the cartilage of the jaw.

CASCARA SAGRADA.—Cascara sagrada, or sacred bark, is the dried bark of the Californian buckthorn, collected at least one year before being used. It is a very serviceable drug for the treatment of chronic constipation, as one of its great advantages is that gradually increasing doses are not required. The liquid extract is very bitter, but this can be circumvented by taking the drug in capsule form, or the taste may be concealed by various aromatic substances, a well-known palatable preparation being cascara evacuant. Cascara sagrada acts as a tonic to the bowel and does not purge or cause unnecessary pains. The drug should be taken on retiring at night and continued for about ten days, gradually lessening the dose until finally the medicine may be stopped altogether. Constipation in a child will often be relieved by one to three drops in syrup, one to three times a day.

CASCARILLA.—Dried bark of Croton Eluteria. It contains an oil, also a bitter substance called cascarillin, together with resin and tannin. Because of its bitter principle, this drug may be used to improve the appetite and digestion. An infusion is made by using 1 in 20 of boiling water and allowing the mixture to infuse for 15 minutes. The infusion will not keep for more than a day. It is pleasant to take and is suitable for promoting the appetite and digestion, particularly during the convalescent period.

CASEATION.—This term is applied to a form of degeneration, in which the structures of the body are converted into a soft, cheese-like substance, usually due to tuberculosis.

CASEIN.—The chief protein constituent of milk, the curd, is known as casein. It is obtained from the milk by the action of acids and rennet, and is much the same thing as white of egg, but contains more nitrogen and a large amount of phosphorus. It constitutes the curd of milk, and in human milk the curd is much less firm than in cow's milk. The curdling of milk involves two different processes. In the first place, the rennin acts upon the casein of the milk and converts it into a substance known as paracasein. Secondly, the paracasein mixes with the calcium salts of the milk, forming an insoluble protein, which is the curd. The value of this curdling action is not apparent, but it is believed that casein in the solid form may stay longer in the stomach and thus be submitted to gastric digestion, instead of passing promptly into the duodenum, as happens with liquid material. The action of rennin goes no further than the curdling;

the digestion of the curd is carried on by the pepsin, a digestive substance found in the gastric juice.

In order to obtain a light, easily-digested curd, milk may be diluted with soda water, and for a baby's bottle, the cow's milk may be diluted by adding some lime water.

CASTOR OIL.—One of the most useful and indispensable drugs we possess is castor oil, which is obtained from a plant that grows freely in India. The oil is abstracted from the seeds of the castor oil plant (Ricinus communis) and is colourless or pale yellow. It is exceedingly disagreeable to take in an undisguised form, but since it is so very valuable as a medicine the patient would be well advised to make up his mind both to swallow it and to keep it down when it is swallowed.

Castor oil is so useful because it is almost the only purge which will clear the bowel thoroughly with one dose of medicine, and it does not cause unpleasant griping pains. For this reason it is used when some doubtful article of food has been eaten and it is desired to get it thoroughly cleared out of the bowel before it can do further damage, or in cases where something is irritating the intestine which has not been removed by other aperients. It is given as a routine dose the night before an operation, so that no inconvenience will be caused by a loaded bowel at the time of the operation.

The action of the castor oil is lubricating as well as aperient, so that a smooth and effortless movement of the bowels is obtained without any of the violent muscular contractions that are caused by doses of other aperients such as aloes when they are used in doses large enough to obtain a thorough clearing out. For this reason castor oil is a useful opening medicine for pregnant women. Young children, too, take it very well. It is most useful in the single dose method, because if taken continuously it has a binding effect on the bowels.

As was said above, castor oil is extremely unpleasant to take and many people say they cannot take it at all. This is largely because they do not realize sufficiently its benefits. The chief tip to help the squeamish to get it down is to avoid getting the smell and taste of it. For this reason it used to be popular to hold the nose, approach the spoon to the mouth and gulp it down. The taste, however, is almost as bad as the smell, so place a few drops of peppermint water, brandy, lemon juice or coffee in the bottom of the medicine glass, pour in the castor oil, and cover with more of the brandy or whatever has been used. In this way the whole quantity will slide down the throat without the oil being tasted. Castor oil can now be obtained in capsules and there are also many preparations of castor oil on the market in which the taste and smell are reduced to a minimum.

CATALEPSY.—Is a condition in which there is a blind obedience to any suggestion made. People so affected will imitate any action seen; they will repeat like parrots any short sentences spoken to them; and they will allow their limbs to remain placed in any awkward position. Whilst they are apparently quite happy, or at any rate do not seem to mind, patients with catalepsy will hold any position in which they are placed for several hours without obviously getting tired. In many cases there is also an obedience to orders, however absurd, or however dangerous their nature. This is something like the condition which is seen in people who have been deeply hypnotized, but goes beyond it. Catalepsy is more often seen in people suffering from a grave mental disorder, dementia præcox, but it may also occur occasionally in the course of some forms of hysteria. There is usually no difficulty in deciding which trouble the patient is suffering from, as in the more severe condition other signs are present. Also, it is rare for catalepsy to persist for more than a few days in any other than the dementia præcox patient.

CATAPHORESIS.—The introduction of drugs into the system through the skin by means of an electric current is known as cataphoresis. It may be carried out through the medium of ointments or solutions applied by the electrode of a battery. It is a method largely used in rheumatism and other affections of the joints. (*See also* IONIZATION.)

CATARACT.—The lens of the eye is a crystalline substance, rounded on both sides, and placed just behind the iris or coloured part of the eye. It forms the image of an object looked at upon the retina. (*See also* EYE.)

Cataract is a disease in which vision is more or less obscured because the lens of the eye becomes progressively more opaque, or, rather, intransparent. The patient "sees through a glass darkly." This intransparency is caused by the formation of minute

drops of abuminous ("white of egg") fluid among the fibres of the lens. These fibres are arranged on one another like the leaves of a book. The lens grows slightly all through life, and the increase would be greater than it is but for a process known as condensation, which is always going on. In childhood the lens is soft, but from the age of about twenty-five the central parts become harder, forming what is called a nucleus, while the outer part, or cortex, remains soft. At thirty this process is readily seen when the eye is examined, and it goes on, becoming more and more marked until at about the age of seventy all is nucleus. As the nucleus hardens the pupil of a middle-aged person begins to look greyish, while that of a child is perfectly black. This smoky appearance, which is quite normal, is sometimes mistakenly taken to mean cataract.

Cataract is a very common disease; it has been estimated that it is present in 96 per cent. of people over sixty, but it is usually so slight that it gives rise to no trouble. Sometimes, however, the density of the lens increases, and the patient has what is known as a *hard or senile cataract.* It begins usually at about fifty-five or sixty. It is commonly thought that senile cataract is hereditary, or occurs as a result of other diseases of the eye, both of which ideas are incorrect. Cataract is so common, as has been seen, that it is easy to imagine heredity to be a factor; and doubtless other eye disease may be present in an elderly eye, but it occurs quite independently of these.

Roughly speaking, there is only one symptom, that of increasing difficulty of sight. This is worse in a bright light, because then the pupil contracts, and the patient is only using the central portion of the lens, wherein is the worst of the opacity. He often walks with bent head, and shades his face with his hand, in order to cause enlargement of the pupils. In the great majority of cases, both eyes are affected, though the cataract is not necessarily equally advanced; this point is of considerable importance when treatment is to be decided upon. When the cataract is advanced, and practically the whole lens is affected, the appearance is as if the pupil were filled with ground glass. "Black" cataract, so-called, only differs from the ordinary form in the colour of the lens, which in old people may gradually assume a dark brown or black discoloration.

The various treatments that have been tried to prevent or retard cataract are legion, and none of them is of the slightest use. Two palliative or "relieving" measures only need be noticed. One is a preliminary operation (iridectomy), which is favoured by some surgeons; the other is the use of atropine drops in very weak strength, which assist in dilating the pupil, and so give better sight for the time being by illuminating the outer and less affected portions of the lens. Atropine must be used with very great care, and only under medical supervision, or a disease known as *glaucoma* might be caused. Indeed, some specialists entirely forbid its use in any patient over forty unless the tension (or hardness) of the eye is low.

Treatment.—Before operation: the only cure, as is generally known, is to wait till the cataract is "ripe," and then to have it removed by operation. The ripening may take a considerable time, the usual being two to three years. An eye specialist will of course decide when the time has come to operate, but in the general way, when the patient has lost his reading power, the cataract is ready. In other words, the lens is sufficiently hard to be removed. If "over-ripe," further changes take place in the lens and its capsule or covering, and an operation then is not nearly so satisfactory as one performed at the proper time.

Before operation is finally decided upon, however, several factors must be taken into consideration, such as the age of the patient. A man of seventy-five or eighty, for instance, has not a very long expectation of life, and also, at that age, changes in the cataract are exceedingly slow, so that it is often best to operate rather early. The state of the general health, too, is of very great importance: such complications as chronic bronchitis, with its troublesome cough; deafness, which is a most awkward extra disability; a large amount of sugar in the urine (a little does not matter, as it so often occurs in elderly people); albumen in any quantity in the urine; skin disease affecting the face; great feebleness, or excitability, or unsoundness of mind, all must be considered very carefully before operation is finally decided upon.

The state of the eye itself should also be borne in mind. It is useless to operate on an eye in which other parts are affected. It is always advisable, therefore, to have the eyes

thoroughly examined by a specialist *early*, before the cataract becomes so dense as to obscure the back of the eye and make examination difficult or impossible. Most specialists allow the patient to use his eyes as much as he likes, within reasonable limits, while awaiting operation; others prefer the better eye only to be used for reading. As regards the use of spectacles before operation, the patient may have these altered from time to time if he likes, but even the most careful correction only lasts good for a very short time. Generally, patients are advised not to waste their money in this way, as very little benefit is obtained.

The operation is usually performed under a local anæsthetic, and though it naturally demands great skill, it is very safe and successful even in aged people.

Treatment.—After operation. The *treatment* after operation is simple, and a good result depends to a very great extent on the obedience and quietness of the patient. It was formerly the custom to insist on complete darkness after the operation, but this, together with the patient's anxiety about his condition, sometimes produced a form of mental trouble—generally relieved when the room was brightened. Surgeons still vary in their after-treatment, but the modern tendency is to have few dressings and a moderate amount of light. By some it is considered best to err on the safe side: they tie up the eye for three or four days after the operation, changing the dressings and examining the eye once daily. Others prefer to use no dressings whatever on the eye, except a wire shield for safety's sake, but advise the patient to open the eyes from time to time, for short periods, after the first two hours have elapsed.

All insist on bed (except in the case of diabetic or very stout patients, who are more comfortable up), but allow the patient to sit up on the third or fourth day. At first he should be careful to lie on his back or the sound side, and should put no strain on the eye by trying to help himself in any way; his attendants must do everything for him. The room is shaded but not dark, and the bed placed with its head to the window. At the end of a week the patient is usually up, and after another week he may return home.

When the patient has recovered he will require two pairs of glasses, one for reading, and the other for distant sight. The two pairs are necessary because glass lenses naturally have no power of accommodation in the same way as has the natural lens.

Cataract also occurs at this or at other periods of life from different causes. Very many causes have been suggested, but some are doubtful and some are rare. Only the more usual forms will be considered.

Soft cataract occurs at an earlier age than the preceding form. In these cases the nucleus is not yet fully formed, and the cataract forms "streaks" throughout the lens, the outer portions generally being more affected. The patient not only complains of increasing defect of sight, but notices "motes" before his eyes; not floating, as are frequently seen by healthy eyes, but stationary. A bright object may be seen multiplied, especially a bright light in the dark. A moderate degree of short-sightedness may come on, which is for a varying time relieved by spectacles. This is often known as "second sight," as the patient may previously have been wearing glasses for "old" or "long" sight, and now finds that he can read better without than with them. This stage may continue for a considerable time; but, as a rule, soft cataract is far more rapid in its onset than hard cataract. It may take a few months, or weeks, or only days, and may be caused in various ways, the two most common appearing to be as a result of diabetes, and from damage.

Treatment.—In soft cataract treatment, atropine is useless. The operation performed is usually a very simple one. In *diabetic cataract*, both eyes are always affected and the cataract develops remarkably quickly. In general, operation gives satisfactory results, though diabetic patients have dangers of their own. Under no circumstances are both eyes operated on at the same time, even if the cataract be equally advanced. Diabetic cataract has been known to clear up, but so rarely that it is never considered wise to wait "on the chance."

Traumatic cataract, or cataract due to injury, begins to form immediately after the damage is caused to the lens, the rapidity depending on the age of the patient and the extent of the damage. The younger the patient and the greater the damage, the more quickly will the cataract form. The trauma is not necessarily from a direct blow

or wound, it may be from such a distant agent as a lightning flash, though this is rare.

Treatment.—The surgeon's duty is to "stand by" until the cataract is ready, and seize the precise moment for operation. Atropine is generally administered to keep the iris dilated, and out of the way of the rapidly-swelling lens. In older people the operation may be performed early; in the young it is best to wait as long as is safe.

Congenital cataract is found in children. In rare cases it may be severe enough to be noticed at a very early age; but generally it is only discovered when the child goes to school, as it is seldom very severe and does not get worse. The child is noticed to hold his books very near his eyes, and draw his brows down, in order to reduce the light and so enlarge the pupil. He frequently, but not always, shows signs of rickets, and appears to be a little "wanting." This form of cataract is always present in both eyes, and is caused by two of the leaves of the lens, one in front and one behind the central point, being laid down opaque instead of transparent. The other layers are all clear. In the treatment of this form of cataract the surgeon does not always operate.

Treatment.—If vision is fairly good, it is often better policy to correct it as far as may be with glasses, and leave well alone. On the other hand, if vision is seriously interfered with, the proper course is to operate.

CATARRH.—Inflammation of mucous membrane in any part of the body is known as catarrh, though frequently the word is used to describe a catarrhal cold in the head. When the mucous membrane of an organ is inflamed owing to the action of harmful bacteria or the presence of irritating material it usually gives off a wet discharge, as in the case of acute nasal catarrh or bronchitis, which is inflammation of the bronchial tubes. Catarrhal conditions of the bowel and stomach are very frequent both in temporary and chronic form. They are known as gastritis and colitis. Catarrh of the gall-bladder is cholecystitis. The term summer catarrh is sometimes used to describe hay fever, and catarrhal fever is usually influenza. Dry catarrh is the term used for a kind of bronchitis with cough and pain but no expectoration.

CATARRH, NASAL.—Nasal catarrh or persistent discharge from the nose is often looked upon as a disease, and is popularly supposed to be incurable. It is not, however, a disease, but only a symptom that something is wrong with the nose. A great many conditions can give rise to nasal catarrh and most of them are curable. The most frequent cause of nasal catarrh is repeated attacks of cold in the head, which is an infectious disease and is caused by quite a large number of different microbes, some of which are more virulent than others. When the microbes are of a mild type the cold usually clears up quite soon; but when a more virulent type of microbe is responsible, such as the germs of influenza or pneumonia, it may not clear up and a chronic catarrh results.

Treatment.—One of the best methods of treating chronic nasal catarrh is by a simple nasal douche. This should not be sniffed up the nose, but allowed to run through from a glass douche, or else syringed up by a rubber ball syringe. If the douche is sniffed up it may convey infection to the other parts of the nose and even to the ears. A favourite douche is to take equal parts of bicarbonate of soda, borax and common salt, and make them into a powder. A ½-teaspoonful of this powder to a ½-pint of warm water is douched up the nose once or twice a day. Some people prefer nasal drops of menthol in liquid paraffin, 10 grains of menthol to 1 oz. of liquid paraffin. If these simple methods do not clear up the nasal catarrh after carrying them out regularly for three or four weeks, the nose should be examined by a doctor as there may be an infection of one of the air sinuses of the nose, or nasal polypi may be present, or the bone of the nose may be bent, preventing proper drainage.

CATECHU.—This is an extract of the leaves and young shoots of a tree grown largely in the East. It may be used as an astringent in cases of diarrhœa. It is also used as a gargle and mouth wash for relaxed throats.

CATGUT.—Catgut is the material used for tying blood-vessels or stitching together skin and tissues in surgery. It is necessary for this purpose to use a material that can be thoroughly sterilized and which will also be absorbed in time. A material that is absorbed too quickly would not serve the purpose, nor would one that did not absorb at all. The guts or intestine of various animals has been found to answer the

purpose almost perfectly, and the prepared material, from whatever animal it comes, is collectively called *catgut.* The most usual sort of catgut is that prepared from sheeps' gut. The intestines of the sheep are soaked and scraped clean of mucous membrane until only the elastic tissue remains. This is twisted into strands and put to harden in a mixture of sulphurous and chromic acid in order to toughen it so that it will not absorb too quickly. It is then kept for from two to three weeks in a 1 per cent. solution of potassium iodide, and then sealed in sterile tubes ready for use. It cannot be boiled. Catgut remains unabsorbed in the tissues roughly as long as it is steeped in the acid preparation, so that the surgeon can use a catgut that will remain firm until he is ready to take out the stitches from the wound or, until the tissues are united sufficiently to hold together without it.

CATHARTIC.—A medicine which is used to produce an evacuation of the bowels is known as a cathartic. This group of drugs includes many varieties, and some have a stronger action than others. Certain substances, such as Epsom salts, are used to make the stools more liquid as well as to increase *peristalsis,* which is the rhythmical tightening and loosening of the walls of the intestine whereby the contents of the intestine are passed onwards.

The milder cathartics include aperients and laxatives such as liquid paraffin, sulphur, etc., which usually produce one or two motions a day without any irritation to the bowel. The more severe cathartics include such medicines as castor oil, calomel, cascara, phenolphthalein, etc., which produce more frequent and more watery stools. The more drastic purgatives include scammony, jalap, podophyllum, and croton oil, but these should only be given in cases of very obstinate constipation, and on no account should they be given to pregnant women, children or to those in a feeble state of health.

CATHETER.—Tubes of rubber or metal which are used for passing into a cavity through a narrow canal are called catheters. The most usual one is the urethral catheter, designed to pass through the urethra or canal through which the urine is discharged from the bladder. If an individual is unable for some reason to pass the urine himself, it will have to be withdrawn by the aid of a catheter. This happens temporarily in many conditions, but sometimes, in cases such as that in which the pressure of an enlarged prostate gland in an elderly man is disorganizing the working of the bladder, it may be necessary for the bladder to be emptied regularly by catheter for the remainder of life. Long rubber catheters are used for the purpose of washing out the stomach or duodenum and for draining the gall-bladder. The eustachian catheter is a metal or vulcanite catheter used for passing by way of the nose up the *eustachian tube* into the ear for the purpose of inflating the ear. The eustachian catheter can only be used by a doctor specially skilled in the procedure; but it is sometimes necessary for an individual to use the rubber catheter himself either for gastric lavage or for emptying the bladder. It is very important therefore that he should realize the necessity of thoroughly cleansing the catheter. The bladder especially is very easily infected, and inflammation of the bladder or cystitis is one of the most troublesome complaints it is possible to have. A glass or metal box should be kept ready into which the catheter can be replaced as soon as it has been used and sterilized. Before use the instrument should be boiled for five minutes in a clean pan kept for this purpose only, and the hands should be well washed before handling it. Before inserting the catheter a little vaseline or glycerine of borax may be smeared on the end to act as lubrication. After use the instrument should be well washed inside and out in running water and drawn through a little methylated spirit or surgical spirit to dry it. It must then be put immediately into the covered box which is kept for it.

CAUL.—On the head of a new-born child there may be a sort of cap formed by the membranes with which it was covered in the womb. As a general rule the baby's head ruptures these membranes in passing and they are left behind, but occasionally a portion remains adhering to the baby's head. This is known as the caul. This membrane used to be considered to have magic powers and a dried caul carried by a sailor at sea was supposed to protect him from drowning.

CAUSTIC.—Caustics are substances which are able to destroy tissues. They may be applied to the skin as a liquid or a solid. The

most commonly known caustic, is silver nitrate or caustic lunar which is greatly used to destroy warts. The lotion of nitrate of silver may be applied to bedsores and to the affected parts in chronic pharyngitis and laryngitis. Caustics, on the whole, are used very little except in the treatment of warts, corns, and growths, as their action is inclined to cause much irritation and pain. Solutions of caustic potash have been used to remove the outer skin in certain chronic skin diseases and the weaker solutions may be applied to relieve itching, and the irritation of insect bites.

CAUTERY.—It is sometimes very necessary to destroy portions of tissue and this can be done by cautery much more efficiently than by the action of caustics. There are many kinds of cautery, but as a rule this operation is carried out by an instrument heated by an electric current, or in a flame. *Actual* cautery is carried out with a white-hot iron, while *button* cautery is carried out with an iron heated in hot water. In *galvanic* cautery a platinum wire is heated by electricity and applied to the part to be destroyed. The use of the cautery knife is not yet very widespread, but its possibilities in surgery are unlimited. One great advantage of the cautery operation is that it absolutely prevents bleeding from the tissues and a patient may have small portions done at a time in order to prevent the shock of one big operation. (*See also* DIATHERMY.)

CELL.—Cells are the tiny particles of living matter of various sorts from which the whole human body is built up, just as a huge building is built of small stones. In the case of any building its stones can be seen, but in the body the cells are so minute that high-powered microscopes are required to see them. Under the microscope a single cell looks like a tiny drop of jelly with a speck in it. In the beginning our bodies start as a single cell containing this speck which is called the *nucleus*. The firmer substance of the cell is called the *protoplasm*. The nucleus contains still smaller particles called the *nucleoles*. The protoplasm of which the cell chiefly consists is able to move and to take substances into itself for food purposes. Its chief characteristic is that it *grows* and *multiplies*, and changes its form so that the one cell from which we start in our mother's womb increases itself with great rapidity through all the stages of larger and larger embryos until a complicated human body has been built up, composed of millions of cells of different sorts and uses and the baby is born. It continues growing by cell multiplication and differentiation and finally becomes a man or woman.

Cell reproduction and growth.—Cells reproduce themselves by dividing. A change begins to take place in the nucleus which divides into two halves which are known as the daughter nuclei. Each of these daughter nuclei forms the nucleus of two new cells. These again divide, which makes four cells from the original one. Division continues this until masses of cells are formed. At an early stage the cells which are to form the organs the bones and so forth of the body are differentiated from the others, and when they reproduce themselves they form other cells in their own likeness. As well as building the body and its various organs, the cells produce amongst themselves the various substances which are used in the mechanism of the body, the lubricating oils, the food digesters, etc. The life of cells is naturally not as long as the life of the body; they die and are replaced unto many generations. They can also become ill or damaged and be repaired. It will be seen therefore that the cells are the agents by which the body is built up, and is kept in repair. Certain diseases of the body, noticeably tumours and especially cancers, are caused by irregular growth of certain cells. For some reason, or reasons, which have not been fathomed, they change the character of their growth.

CELLULITIS.—When the cellular tissue under the skin becomes infected by harmful germs it becomes inflamed. The inflammation may be localized to a particular small spot, in which case a boil or abscess forms, or it may be general over a larger area but may not show any tendency to gather to a head in any particular spot. This condition is called cellulitis and shows that the tissues are successfully resisting the invasion of the germs. There will be an area of reddened skin with no very definite edges. The skin may be shiny and the region is swollen and tender.

Treatment.—To treat the condition heat should be applied locally, either in the form of hot baths or fomentations, or in a dry form such as hot-air baths or hot pads. The part should be kept raised if possible and must be

kept at rest. Counter irritation in the form of iodine, cantharides or mustard plaster may be applied. Cupping or treatment by suction bells is sometimes employed. The cellulitis may disappear without coming to active suppuration. But if suppuration arises it must be treated, as in the case of an abscess, by incision. (*See also* ABSCESS; BOIL.)

CEREALS.—The cereals have always provided an important source of food to the human race. The varieties which we make most use of include wheat, rye, maize, oats, barley, millet and rice. In the olden days the grain from these cereals used to be eaten whole or roughly ground up, and it is only within the last hundred years that the finer processes of milling have eliminated the germ and outer covering of the seed. Owing to their deficiency of protein and fat, cereals and their food products should be supplemented with other substances such as milk, cream, nuts, butter or eggs, as for example, bread and butter, milk puddings, etc. It is especially necessary in the case of children to see that the diet is not lacking in any of the necessary vitamins. Semolina, macaroni and vermicelli are included in the food products obtained from cereals. (*See also* SUPPLEMENT ON DIET AND INVALID COOKERY.)

CEREBELLUM.—The cerebellum is the part of the brain which lies below and behind the cerebrum. (*See also* BRAIN.)

CEREBRO-SPINAL FEVER is an infectious disease caused by a tiny germ which enters the patient's body through the nose and throat and from there reaches the nervous system, where it causes inflammation of the coverings of the brain and spinal cord. The disease often occurs in epidemics, especially in the winter and spring, and during an epidemic very large numbers of people may be attacked by the disease owing to the fact that certain people, known as "carriers," do not themselves fall victims to the disease, though they harbour in their noses and throats the microbes which can infect those with whom they come into contact. The disease can occur at any age, though in most epidemics young children are more frequently affected. Children are very liable to the disease, and it is particularly dangerous in infants between the ages of six months and three years. There are many and varied forms of the disease, but the acute type is by far the most common.

Symptoms.—The patient has an intense headache, usually felt at the back of the head; he feels generally out of sorts, and the temperature goes up. The earliest sign which may make one suspect the presence of cerebro-spinal fever is stiffness of the muscles of the back of the neck. This soon becomes very marked, and the patient finds that any attempt to bring the head forward gives him pain. He therefore lies in bed with the head drawn backwards and resents any attempt to make him bring the chin down towards the chest. There is very often a shivering attack at this stage, or in children, a convulsion.

Vomiting, not associated with the taking of food, may occur, but is more common in children than in grown-ups. The mental condition soon becomes typical of irritation of the brain; the patient lies huddled up in bed, unwilling to move, disliking any interference, whether this be to feed him, to examine him, or even to talk to him. He may become delirious, talking utter nonsense, or he may lie in a condition of complete apathy, taking no notice of anything, the eyes being open and staring, with a peculiar vacant look. Young children are especially liable to lie motionless, this condition being interrupted at intervals by a distinctive cry, which can never be forgotten by anyone who has once heard it, so high-pitched and anxious is it. The cry is independent of any headache the child may have, and is quite purposeless, though no less distressing to those who have to listen to it.

In a considerable number of cases a rash appears over the body and arms during the first week of the illness. The rash may take the form of large rose-red spots, or it may look rather like a measles rash. The patient loses flesh rapidly, and at the end of a week appears quite wasted. Loss of sleep, which is the usual accompaniment of the severe headache, adds to the patient's misery. If the illness has not been diagnosed by the end of the first week and the essential treatment has not been given, the outlook for recovery is poor, but in few other illnesses, if any, is it possible for a patient to be so ill and yet to recover completely, as in cerebro-spinal fever, provided that the adequate treatment is forthcoming early enough. The certain diagnosis is made by examination of the fluid which surrounds the spinal cord. Some of this is taken by puncturing the space

between the spinal cord and its coverings in the lower part of the back and withdrawing the fluid with a syringe. In cerebro-spinal fever the fluid looks cloudy when it is withdrawn, owing to the presence of many pus cells in it. In these pus cells there can be seen, under the highest power of the microscope, the microbes which have caused the disease. Sometimes, if very few of these are present in the fluid, it may be necessary, in order to be able to see them under the microscope, to make them multiply first by feeding them for twenty-four hours on special food which they like and will thrive on. Therefore, in any particular case, a certain diagnosis may not be possible until the day after the fluid has been removed, though in most cases it can be made the same day.

Treatment.—As soon as the diagnosis is settled, treatment by serum is carried out, and this is absolutely essential. The earlier the serum treatment is given the better the hope of complete recovery. Hence the extreme importance of early puncture of the spinal canal. The serum is given into the canal, and the results of its administration are often dramatic. The patient who has lain apparently unconscious for several days may after one dose of serum become quite normal mentally, and though weak and exhausted, presents quite a different picture to that seen before the serum was given. Vigorous serum treatment is, however, essential as relapses are common, and it is not safe to depend on one dose of serum to establish a lasting improvement, even in mild cases.

A case of cerebro-spinal fever is best in hospital, as the illness is not only an exhausting, but a distressing one to watch. If the patient is nursed at home, the main trouble is to ensure that enough food is taken to maintain his strength as far as possible. In the early stages, when the patient is irritable and resentful of attention, it may be very hard to persuade him to take even a liquid diet. Raw eggs, beaten up in milk, freshly prepared meat essences, and as much water as the patient can be induced to take should be given in small quantities at frequent intervals. Later in the course of the illness, when the patient is only semi-conscious, the act of swallowing cannot be relied on, as some of the food may "go the wrong way" and enter the lungs. Feeding by means of a nasal tube, inserted by the doctor, three or four times a day, must then be resorted to. According to the age of the patient, from a quarter to half a pint of peptonized milk, or of beef essence, is given at each feed. A raw egg may be given with the milk. The bowels must be kept well opened. Tepid sponging often helps to soothe the restless patient when the fever is at its height. Those in attendance on the patient should pay great attention to personal cleanliness, and should come into contact with as few people as possible whilst they are in charge of the case, for fear of spreading the disease. They should gargle the throat twice a day with either a weak solution of permanganate of potash (a solution which is faintly pink is the right strength), or with a half-strength solution of peroxide of hydrogen. The latter solution can also be used to sniff up the nose, or the nose may be sprayed with a weak solution of iodine and menthol. Those in attendance on a case of cerebro-spinal fever rarely themselves take the disease; the danger is that they may give it to other people.

CERVICAL.—This word is derived from the Latin, and literally means "the neck." It is applied to various glands and nerves which lie in the region of the neck, and there are also the *cervical vertebræ*. It is also used to denote the *cervix* or neck of the womb.

CERVIX.—The cervix is the neck of the womb. It is a frequent focus of ill-health in women because it is so often torn during childbirth. If the tear is neglected and becomes infected with harmful germs, it may cause serious trouble, and very often a small tear will be responsible for the state of poor health which many women fall a victim to, in which there is a chronic slight discharge from the front passage and chronic feelings of discomfort and tiredness. An old and neglected cervical tear may become the seat of cancer at a later stage. A doctor should be consulted, as the condition is very amenable to skilled treatment.

CHAFING.—When two surfaces of skin rub together it produces a condition of irritation known as chafing or intertrigo. (*See also* INTERTRIGO.)

CHALK.—Chalk or calcium carbonate is used in medicine in many different ways. In the prepared form, which is calcium carbonate freed from most of its impurities by washing and drying, it is used as a dusting-powder, and it also forms one of the

ingredients of many of the tooth powders. It may be used internally with great benefit in cases of diarrhœa and colitis, and also in chronic dyspepsia.

CHALK STONES.—Chalk stones are often referred to as gout-stones or *tophi*, and are found under the skin of gouty people. Although these deposits are called chalk stones they are made up of sodium urate. The most common site for these stone-like deposits is about the knuckles and the lobes of the ear. (*See also* GOUT.)

CHALYBEATE.—Any water or medicine which contains iron is referred to as chalybeate. The waters at many of the various spas, such as Harrogate and Bath, are termed chalybeate waters, those at Trefriw in Wales being particularly strong. They are excellent for persons who suffer from bloodlessness, because iron is one of the best medicines for such a condition.

CHANCRE.—A chancre is an ulcer which develops about four weeks after infection by one of the venereal diseases, usually syphilis. A fluid may exude from it which is found to be teeming with germs. The sore may be of the hard or soft variety, but it is generally understood that the term *hard chancre* is applied to the sore which is an early symptom of syphilis. This sore generally appears in the region of the genitals, but chancres may occur on the lip, tonsil, tongue, breast, finger and elsewhere. The *soft sore* is a venereal disease, but not syphilitic, and may be treated and cured in a short time by the use of antiseptics; but as in the case of hard chancre, it is essential to seek the aid of a doctor as soon as the affection is discovered, and have proper attention and treatment. (*See also* SYPHILIS.)

CHANCROID.—This term is applied to a soft sore, caused by venereal disease. (*See also* CHANCRE.)

CHANGE OF LIFE.—Women have many ways of referring to the period when their child-bearing life ceases, but the most common popular name for it is the change of life. Doctors talk of it as the climacteric or menopause, or sometimes even the critical age. This last name is a very suitable one, because the change of life is always a critical age for women. Many women pass through the change with little discomfort; some have a bad time for a couple of years, and then take a new lease of life and begin to enjoy themselves again; while others, unfortunately, settle down to a life of invalidism and misery. Many of the sufferings of these women could be avoided with proper care and consideration during the critical age

The chief physical change that takes place at this time is that the ovaries and other organs of reproduction cease to perform their function and become atrophied and shrivelled. This change occurs at different ages in different types of women, but it is somewhere between the ages of thirty-five and fifty-five —between forty-five and fifty being the most usual age. As a general rule, it may be taken that the earlier the menstrual periods start, the longer they will go on, and that the women in the same family are likely to have the change of life at about the same age. Certain factors make slight differences to the age at which the change may be expected. For instance, very early marriage may shorten the sexual life, and spinsters and childless women are likely to reach the change some years before married women who have had children and have led a normal sexual life. States of health in which the vitality is lowered may also bring on the change at an earlier age.

Physical Changes.—It has been said above that some women pass through the climacteric without any particular discomfort, but these are in the minority. Most women feel discomfort in various degrees, and some women become upset mentally.

It is not always easy for a woman to know when she is approaching the change of life, and the first time a period is missed for a few days she may imagine that she has become pregnant. In most cases the periods cease gradually, either by becoming scantier until they finally cease or by missing three or four months at a time, then appearing again in a regular fashion for some more months until they again disappear for some more months. The time taken from the first irregularities until the final ceasing of the periods is usually between one and two years. In a few cases the periods stop suddenly and completely, and there is generally a large amount of disturbance to the general health with this type of climacteric. In the earlier stages of the change there may be an increased flow at the periods instead of the usual diminished flow. This excessive flow, or *menorrhagia*, as it is called, should cease after a

few months. If it does not do so a visit should be paid to the doctor, as it may be the sign of some trouble, such as a fibroid tumour or even the beginning of cancer, and such conditions can be cured if taken in time.

The unpleasant symptoms which are very general amongst women at the climacteric are mostly due to the upset of the nervous system. These are flushes, nervousness and irritability, disturbances of the circulation causing "pins and needles," etc., and dyspepsia and neuralgia of various sorts. It is also noticeable that many women become unduly fat at this time.

Flushing.—Of the symptoms of the climacteric the condition known as flushing is the most distinctive. It is a rush of blood to some part of the body, such as the face, or it may be a sudden hot feeling all over the body. These hot flushes may be followed by feelings of chilliness. Palpitations are also frequently present. The heart may suddenly be felt thumping rapidly, and the woman may feel breathless and alarmed for a short time. The attacks of palpitation may come on after exertion or at any odd time without rhyme or reason. In some women they come on at night and waken them up out of their sleep. These flushings are very unpleasant, but are in nowise dangerous, and always vanish after the change in life has become established. Ringing in the ears and dizziness are also frequently present.

Neuralgia.—One of the most troublesome accompaniments of the change of life is neuralgia. It occurs in many forms. Sometimes it is merely fleeting pains in different parts of the body, or it may attack some particular part such as the breast. If pain occurs in the breast at this time it is as well to have an examination by a doctor, as cancer of the breast is liable to start at this age. Another painful form of this malady which is not uncommon at this time is neuralgia of the stomach, in which pains are felt in the middle region of the abdomen. Headache, especially one-sided headache, is common, and backache often occurs.

Obesity.—The tendency to put on flesh about the time of the climacteric is distressing to many women. There are a few cases where the increase in weight is accompanied by dryness of the skin, falling out of the hair, dulling of the intelligence and slowing of the heart's action. In these cases there is some glandular deficiency in the thyroid gland or the pancreas which should be corrected by the administration of thyroid extract, or in certain cases, insulin. These remedies should, of course, only be taken under a doctor's care. In most cases of obesity in middle-aged women, however, the fault is due to their own faulty habits rather than to any disease, and the treatment is the same as for obesity at any other time. When a woman who has hitherto led an active life finds herself temporarily unable to do as much as she used to in the way of work and exercise, she is very apt to put on flesh rapidly, unless she curbs her diet and limits the amount of starchy food she eats. (*See also* OBESITY.)

Nervous symptoms.—As well as the physical changes that take place at the change of life there are mental changes. The sexual desires are diminished in most cases, though in happily married couples complete loss of desire rarely if ever takes place as a result of the menopause. On the other hand, some women, especially those of neurotic temperament, feel greatly increased desire, and in some cases become unable to control their emotions. These women may be such a nuisance that they have to be shut up in institutions where they can be cared for by specially trained nurses. Their behaviour, too, may cause the break-up of a home that has hitherto been happy. Forbearance on the part of the husband may tide over the dangerous period until the wife returns to a more normal frame of mind. At this time also, the unattached woman of this neurotic, over-sexed type often falls a prey to designing persons of either sex. She may rush into a hasty and disastrous marriage often with someone young enough to be her son, or she may land herself in other undesirable situations.

In many other ways the general health of a woman may suffer at the climacteric. She may have indigestion in various forms; constipation may be troublesome, etc. All these conditions should be corrected in the ordinary way, but it is a very great mistake for a woman to consider herself an invalid at this period. Her life should be modified if possible so that she may go slowly, avoid as much worry as possible, and have extra rest when the need is felt. A placid and easy-going existence is the best at this period, but the slowing down should be regarded as

temporary, just a well-earned rest before embarking on a new phase of life. Many women really begin thoroughly to enjoy life after the menopause, and their health improves almost as if the cessation of the reproductive functions had released more energy for the upkeep of the body.

CHAPPED HANDS AND LIPS.—Normal healthy skin is rendered resistant to outside irritation, and kept in a soft, smooth condition by the fat and moisture contained in its outermost or horny layer, and poured out upon the surface of the skin by the sebaceous and sweat glands. If the horny layer of the skin is for some reason deprived of too much of its fat and moisture, it becomes dry and rough, and tends to crack or "chap." This is most commonly seen on the hands and lips; it is, indeed, rare in other parts unless actual disease is present. Some skins are naturally drier than others, and so chap more easily, but all require some external irritant before chapping occurs, such as exposure to cold and windy weather; a habit of biting the lips; too much washing with hot water and soap, especially strongly alkaline soaps (as in washing powders), which will dissolve the fat out of the skin; and imperfect drying of the skin, especially in cold weather.

Treatment.—The treatment of chapped hands and lips is fairly obvious; it lies in prevention. If the skin is properly protected, chapping will not occur. Warm or tepid water should be used for washing, not (if it can be avoided) hot or cold, and the skin should be carefully dried afterwards. If it is inclined to be dry, it should be "fattened." The best time to apply fats is immediately after the natural fat has been removed by washing. Lanoline is perhaps the very best preparation to use, as it most nearly approaches the natural fat. A very little should be applied, well rubbed in, and the excess wiped off. At night more may be used, and loose cotton or chamois gloves worn. Lanoline may also be applied to the lips, or a softening lipstick used, the base of which is either lanoline or cocoa butter.

If cracks have already occurred, lanoline again is the best preparation to use; a lanoline cold cream is also good; camphor ice or ointment acts as a mild counter-irritant, and is often very successful in curing chaps.

A word may be said about the very general use of cold cream or glycerine preparations as emollients. The former is an excellent cleansing cream, but as its chief components are wax, liquid paraffin, or similar substances which are not fats, the skin is only greased not softened. Glycerine (like soap) "softens" the skin by swelling its horny layer and thus mechanically closing the cracks; but the skin is to some extent harmed by this, and loses a little more of its natural resistance to irritants. Pure glycerine should never be used for chaps, as glycerine has a great affinity for water, and unless diluted with a watery solution such as rose-water, will take up water from the skin, thus causing the condition to become worse, and giving rise to much pain.

CHAPS.—Chaps are the sore cracks that come on the hands, face or other exposed parts of the body in frosty weather. They are fully dealt with under the heading CHAPPED HANDS AND LIPS.

CHAULMOOGRA.—Chaulmoogra oil is obtained from an evergreen shrub which grows in Burma and other parts. This oil is used a great deal in the treatment of leprosy, and it is also given for tuberculosis and rheumatism.

CHEIROPOMPHOLYX.—This disease with the long name is quite common and can be very irritating. It chiefly affects the hands between the fingers, and may extend on to the backs or palms of the hands and up the arms. The feet are also frequently affected. Both hands may be involved. The disease consists in the development of small blisters filled with clear fluid, and almost embedded in the skin. They are generally described as having a "sago-grain" appearance. They become itchy, especially at night, and the blisters are either scratched off, or dry up in a few days. The disease is somewhat chronic; crops of blisters occur one after the other for a few weeks, then disappear, but are liable to return again for years afterwards. It is most common in young women, and "damp hands," i.e. over-sweating, are associated with the condition.

The character of the disease varies a little with its situation. On the back of the hand the skin is thin, and the blisters readily swell up and burst. On the palms, the fluid spreads under the thickened skin, rarely forms blisters, and causes the skin to peel off in large flakes. Between the fingers the skin is

intermediate in thickness; blisters form, but do not break.

Treatment.—Two different views are held as to the cause of cheiropompholyx—one that it is nervous in origin, and the other that it is due to infection by germs. Those who hold the first view leave the skin condition alone, and treat the complaint by tonics and other measures to improve the general health. Those who hold the second view treat the condition by frequent bathing with antiseptic solutions, such as weak mercury sublimate and the application of salicylic acid as an ointment or dusting powder. The possibility of *ringworm* or "itch" is always considered, and a proper examination made to exclude this. When the attack is over, the excessive sweating should be treated, and the hands "hardened" by resorcin or formalin soap. If the disease has spread to the backs of the arms and hands, it often appears to be more acute, and a soothing treatment is required. Calamine lotion or a simple dusting powder (talc, not starch) is preferable to the antiseptic treatment mentioned above.

CHEST.—Chest is the popular name for the *thorax* or upper part of the trunk of the body. It is a framework of bone and cartilage in which are found the principal organs of breathing and circulation. The lungs and heart are vital to the maintenance of life, and are of soft, easily damaged material and require room for expansion. The chest therefore takes the form of a strong bony cage in which these vital organs are protected from injury and in which they have room to contract and expand freely.

The chest extends from the shoulders to the diaphragm. Its principal bony structure is the spine. From the spine the twenty-four ribs extend, curving round to meet the breastbone or *sternum* in front. The first five ribs on each side extend directly from the spine to the breastbone, the second five join into one bone before being attached to the breastbone, and the last two on each side float loose in front, and are attached only to the spine, and not to the breastbone. The ends of the ribs, where they join the breastbone, are formed not of bone but of cartilage, which gives them a certain amount of flexibility, and enables them to be moved by the chest muscles as they expand and contract in the process of breathing in and out.

The measurement round the chest in men is usually between 32 and 42 inches, but the girth is not so important as the difference between the measurements taken during breathing in and breathing out, which gives the range of movement of the chest. A good range of movement is conducive to good health. Many people are born with narrow chests which are not necessarily weak chests, but they should try to develop them by breathing exercises, correct posture and as much open air as possible, as the narrow or small chest is more liable to lung troubles than the broad chest. It is useful to accustom weak-chested children at an early age to sleeping with the window open at night.

The chest in old age or as a result of chronic bronchitis may become rounded, or, as it is called, barrel-shaped, through chronic enlargement. In this type of chest the range of movement will be very small, probably not more than one inch difference between breathing in and breathing out. Rickets in infancy is responsible for two common sorts of deformity of the chest. The condition called *pigeon-breast* is very common in rickety children, and there may also be bony swellings on the ribs where they join on to the breastbone causing a condition popularly known as "rickety rosary." (*See also* HEART; INTERCOSTAL NEURALGIA; LUNG; RIBS, ETC.)

CHEST, PROTECTION OF.—Many people suffer from colds in the chest, and it is advisable, especially in winter-time, to wear a garment made of wool or flannel next to the chest. The garment should be sufficiently warm but not too bulky and thick, and should be made of an easily washable material.

CHICKEN.—The flesh of chickens is of great value in invalid and convalescent cookery. The breast of the bird is particularly to be recommended, as it is the most easily digested meat known. To obtain the best results, a young bird should be chosen, and this can be done by feeling the end of the breastbone. If the bone is pliable and soft the bird may be judged to be young and tender, for the older the bird becomes the harder will the bone be. For invalids who cannot eat much solid food, the chicken may be made into broth, and the white meat of the breast may be finely shredded or pounded and added to it. Fricasse of

chicken is also a very palatable dish, and for hot weather a chicken salad may be made with the white meat cut up into suitable pieces and served with cool, crisp lettuce. For the building-up stage, when the patient is able to take more substantial food, roast chicken may be served with suitable vegetables.

To make a good nourishing broth, the bird need not be so young as when used for roasting purposes. All fat should be removed and the bird well washed and covered with about two or three pints of water. A little salt should be added, and the bird should be allowed to simmer gently for about four hours, taking care to add more water at intervals, so that the meat is always just covered. All fat should be skimmed from the top, and then the broth should be strained through a fine strainer. When cool it will be a simple matter to skim any surplus fat which has collected on top. If desired, a little rice or barley may be added when the broth is being heated, simmering it just long enough to cook the rice thoroughly.

CHICKEN-POX.—Chicken-pox or varicella is an acute infectious disease characterized by a typical rash and accompanied by fever. Infection is spread by direct contact, by a third person, or the germ may be inhaled. The organism which causes this disease has not yet been identified. Children are chiefly affected, but adults are also liable to infection. The incubation period lasts from 11 to 21 days, but symptoms generally make their appearance about 14 days after infection. The rash may be the first symptom, but in adults especially, the eruption of the rash may be preceded by headache, backache, discomfort and shivering.

At the beginning of the disease there may be a slight rash or flush, appearing one or two days before the true rash appears. The typical rash may appear on the second day. It attacks the front and back of the trunk of the body and the inner sides of the thighs, and later may spread to the face, scalp, and limb endings. The legs, forearms, feet and hands are generally involved to a lesser degree, and in very rare cases spots may appear on the mucous membranes of the mouth or throat. These spots very quickly become pustular and may burst in about 2 days' time. The rash comes out in crops for the first 2 to 7 days, so that spots in the various stages may be seen simultaneously on the body. The vesicles or spots finally dry up into a scab and a crust, which may take from 4 days to 4 weeks to drop off. Scarring does not occur unless the tissues of the skin have been destroyed, but on separation of the scab a slight redness may be present which usually fades and leaves a white spot which may last for years.

The temperature is usually only slightly raised, but in severe cases may be considerably high for a few days. Gangrenous chicken-pox, resembling smallpox, in which the tissues of the skin die, is to be met with in very debilitated children, and is sometimes fatal. In hæmorrhagic chicken-pox bleeding may appear under the skin, or there may be bleeding from the mucous membranes.

Chicken-pox is one of the milder diseases, and its course should be uneventful, except for the severe types. Complications do not, as a rule, arise, but cases of earache, inflammation of the kidneys, laryngitis, and various nervous complications such as neuritis, meningitis and encephalitis, sometimes occur.

Treatment.—The patient should be put to bed until the temperature has returned to normal and all spots have reached the crusting stage. Usually the only treatment required, beyond that necessary for any mild fever, is a local application to ease the irritation of the skin. The patient must never be allowed to scratch the spots. A dusting powder of equal parts of starch, zinc oxide and borax may be applied. During the period when the crusts are beginning to form the body may be sponged with warm water containing enough potassium permanganate to colour it pink. In the final stage, after the crusts have come away, zinc ointment may be applied to the tender skin which is left.

The period of quarantine generally lasts for about 20 days for those persons who have been in contact with the disease, and the patient must be isolated until the last scab has come off, which usually takes from 3 to 4 weeks.

CHILBLAINS.—This disease is only too well known. It occurs during the winter months only, and is found especially in children who are below par (though it may occur at any age). The patients are subject to colds and chills, and, though the heart itself may be healthy, the circulation is somewhat defective. There appears to be

congestion or "crowding" of the blood at the extremities, i.e. the fingers, toes, ears and nose, and with the external application of cold, chilblains develop. They are also sometimes seen on the cheeks in weakly infants. Cold damp weather seems to favour the appearance of chilblains, rather than dry and frosty air; and thin clothes and underfeeding are undoubted factors in their production. Tight boots and gloves, and the too-rapid warming of the hands after exposure to cold, are also blamed.

The trouble begins with an itching, burning sensation in the affected parts, followed by a swelling which is smooth and shiny, and often soft in the middle. These swellings are caused by the tiny veins in the skin becoming greatly dilated, and pouring out *serum* (the fluid part of the blood) into the tissues. Because of the intense itching, the chilblains are invariably scratched and rubbed, blisters form, which break down, and small ulcers result which are difficult to heal. Chilblains usually recur with annoying regularity during cold weather, and many sufferers find that a remedy which gave them relief for one winter has no effect when used in following years.

Treatment is conducted on three lines: general, local, and preventive, the last of which appears nowadays to be considered as of quite as much importance as the others. They all work towards the same end, that of improving the circulation, both local and general. Internally, cod-liver oil and tonics, such as Easton's syrup and Fowler's solution, are given to benefit the general health. Calcium preparations have become very popular of late years. Various ways of giving this have been tried, but the most convenient method is to use calcium lactate tablets, 5 grains, 2 or 3 to be taken 3 times daily. It was thought that calcium, which has an effect on the clotting power of the blood, might be an infallible remedy in cases of chilblains, and sometimes it does produce excellent results. In other cases, the effects are disappointing; it is, however, well worth a trial.

The local applications recommended are too many even to name; only those which have been proved worthy will be mentioned. When itching is the most prominent symptom, calamine lotion, menthol, or cold water applications seem to give most relief. Lately, Bier's congestion has been used for the itching stage, and the results are very promising. Some authorities advise a long application of the bandage (up to six hours) twice daily; others advise several short applications during the day. In this method the bandage should be applied with the limb down. It should then be raised for five minutes, and removed while in this position. The vessels suddenly empty, and the fingers and toes should be briskly rubbed (always upwards) to improve the circulation. This should be repeated two or three times night and morning.

Iodine, in ointment, tincture or collodion, appears to be the most generally successful routine treatment, but must not be overdone, or an "iodine itching" may occur, which may be almost as troublesome as the chilblains themselves. A convenient method is to use the weak tincture of iodine (5 per cent.) as a paint for two nights, and on the third a mild ointment. This may be continued as long as the iodine causes no irritation. If the chilblains have broken, a mild ointment should be used, the object of treatment now being not to stimulate the circulation but to heal the ulcers. Cold cream, boric ointment, and ammoniated mercury in zinc paste are all good. Arctic explorers use an "ointment" of whisky and soap, which is said to be equally effective.

In very bad cases, hot-air baths and X-rays have been found useful, also electric treatment by the high-frequency current, but these methods are not within the reach of all.

The preventive method has been neatly summed up in a few words: prepare in summer for the winter. In other words, preventive treatment must not be given up as soon as the winter's crop of chilblains disappears. *All* cold must be avoided. The clothes must be sufficiently warm, wool being worn both in summer and winter; cold baths or even cold water for washing the hands should be avoided, and the skin should be very thoroughly dried afterwards. General as well as local massage and vigorous exercise all help to improve the circulation. Tight boots or shoes, gloves and collars are forbidden; also garters and goloshes, all of which tend to "damp down" the circulation in the extremities. In short, if the circulation is so much improved, so some authorities say, that the patient's

hands and feet (and therefore the rest of his body) are always warm, chilblains will not occur.

CHILD-BED FEVER.—Child-bed fever is a popular name for the serious infectious disease that arises in women during the lying-in period after the birth of a child. It is described under its medical name of PUERPERAL FEVER.

CHILDBIRTH, PREPARATIONS FOR.—In a normal case with a first baby, pregnancy can often be calculated to a definite date by counting nine months and one week from the first day of the last period before the pregnancy began. This should give the earliest date at which the baby may be expected. There are, however, often variations, usually in the way of arriving too soon, but with first babies it is surprising with what punctuality most of them make their appearance in the world. The date of "quickening" is also a guide, as it occurs half-way through the pregnancy.

Before the date of the expected arrival of the child, the mother if she is wise, should have had several examinations either by her own doctor or at an ante-natal clinic to see that all is in order and going on well. The most dreaded complication of the later stages of pregnancy and the confinement and lying-in period is the condition called eclampsia, in which convulsive fits occur. This condition can usually be avoided if examinations of the pregnant woman's urine are made from time to time during the pregnancy, since the chief symptom that there is a danger of eclampsia is the appearance of albumen in the urine. The medical examinations may reveal other important matters as well. For instance, if the child is lying in the wrong position for birth, it may be necessary to turn it round in the womb. It will also be ascertained whether twins are present, and whether the bony ring surrounding the exit from the womb is larger than the head of the child. If it is not, and the condition is not discovered until the birth has begun, there will be serious trouble; whereas, if the condition is known in time several things can be done.

When all these preliminary examinations show that pregnancy is progressing normally, it is the duty of the expectant mother to keep her health as good as possible, and to prepare for the approaching event with a quiet mind. The nurse or midwife should be engaged well beforehand, as the best ones quickly get booked up. She will advise as to the choice of a room for the confinement, and as to what to prepare in the way of waterproof sheets and other necessary equipment.

Equipment that will be needed.—For a well-equipped confinement which is to take place at home and not in a hospital, the following articles are desirable. A waterproof sheet about a yard and a half square, and an old sheet to use as a draw sheet. A couple of large rolls of cotton-wool and three binders. A special size of sanitary towel is provided by all the makers for use in confinements. Three dozen will be needed. Special surgical safety-pins are safer than the ordinary domestic ones if they can be procured; several, both large and small, will be required for the baby's binder and the mother's. Green or castile soap and a clean nail-brush. A bed-pan, douche-can and three feet of rubber tubing to fit it. Strong scissors, two enamel bowls about a foot across, and two hot-water bottles. A roller towel is often useful, and linen thread will be required. A bottle of disinfectant—usually lysol, unless something else has been asked for by the midwife. Vaseline, methylated spirits, boracic powder for the baby's eyes, and a bath thermometer are other requirements. It will usually be found that some of these things, such as the waterproof sheeting, bed-pan and douche can be borrowed from friends or hired from a chemist. A special tin of dressings for confinements can be obtained from the chemist, which will save a lot of trouble if the expense is not too great.

The layette, or outfit for the baby, is described in the special supplement on the BABY. It should be ready a couple of weeks before the birth is expected. A week or so before the date when the confinement is expected to begin, the room in which it is to take place should be thoroughly "spring-cleaned" and all unnecessary furniture and ornaments put away. The bed chosen for the confinement should be a single one and should not be too low, or it will mean a lot of stooping for the doctor and nurse.

The actual progress of the confinement is described in a separate article called LABOUR, and the after-events are described under the heading PUERPERIUM, which is the name for the period after the confinement before the

mother is restored to her normal state of health—the lying-in period. (*See also* PREGNANCY.)

CHILD WELFARE.—Child welfare is so important nowadays that a special supplement has been written dealing with all the health services which look after the welfare of the child from babyhood to the school-leaving age. (*See also* CHILD WELFARE SUPPLEMENT.)

CHILL.—A person usually complains of feeling chilly when they have been exposed to a draught, or when they have been out in the wet on a cold day. Shivering may be followed by symptoms of a common cold, with catarrh of the nose, and in more severe cases, influenza, pneumonia, or inflammation of the throat may result. Chill may be experienced in many diseases, especially in cases of malaria. The patient should be put to bed and kept warm with hot-water bottles and blankets, and hot drinks should be given. A very excellent drink is made up with whisky, lemon, sugar and hot water. This should be given after the patient has been put to bed.

CHILLI PASTE.—This is a paste made up of capsicum, hard and soft paraffin, and prepared lard. It is an excellent counter-irritant, and may be applied to the skin in cases of chronic rheumatism and neuralgia.

CHIMNEY-SWEEP'S CANCER.—The form of cancer to which sweeps are especially subject is supposed to be caused by the fact that they work amongst soot, which causes irritation of the skin. (*See also* CANCER; CANCER OF THE SKIN.)

CHIN-WELK.—This is a popular name for the disfiguring blisters and pimples that are found on the chin in cases of BARBER'S ITCH, which is described under that heading.

CHIROPODY.—By chiropody we mean the surgical care of the feet, which of course includes the treatment of corns and calluses. A person who specializes in the care of the feet is called a chiropodist. For information about the care of the feet see the articles on CALLUS, CORN, and in the SPECIAL SUPPLEMENT ON BEAUTY CULTURE.

CHLOASMA.—The development of patches of discoloration on the face, especially on the forehead, cheeks and on the skin around the mouth, is known as chloasma. These patches may be brown, yellow or black in colour, and may vary from the size of a sixpence to the size of the palm of the hand. They are often to be seen on the skin of pregnant women, or they may appear during the menstruation period. Chronic diseases of the womb may be responsible for the discoloration, or disorders of the liver may be the cause. People suffering from tuberculosis of the lungs often have these patches of discoloration on the forehead and upper parts of the cheeks.

CHLORALAMIDE.—This drug is obtained from chloral, and it is found to be less poisonous than chloral hydrate. It is used as a hypnotic with more safety than chloral hydrate and it is believed to be free from habit-forming properties. It does not relieve pain, but it is most serviceable in cases where insomnia is due to mental strain. The best way to give it is to dissolve it in a little alcohol and water (the water should not be heated above 130° F.) and drink it before going to bed. The powder may require stirring for some time. As a remedy for sea-sickness, it is recommended with potassium bromide, with orange tincture and chloroform water.

CHLORAL HYDRATE.—The hydrate of chloral is a powerful hypnotic or sleep-inducing drug, and is chiefly used because of its rapid action. Soon after administration of a moderate dose, the patient will fall into a deep sleep, which generally lasts several hours, and which is indistinguishable from natural sleep. On waking, the patient feels refreshed, and there are no symptoms of headache or confusion. Its particular advantage is that sleep can be procured by a dose not large enough to cause intestinal disturbances or any other harmful effects. Children react very well to this drug.

Like every other drug of this nature, it has its dangers as well as its advantages. If it is given in large doses it depresses the heart considerably, and the pulse is also affected. Prolonged large doses may lead to fatty degeneration of the tissues and to paralysis.

Sea-sickness has been treated with syrup of chloral and ammonium bromide in water. It is particularly useful in the treatment of simple insomnia from overwork or worry, but it does not relieve pain at all, so, therefore, should never be given when insomnia is due to this cause. It has been given as a soothing drug in cases of delirium tremens and puerperal convulsions, but such large

doses are required that they may have a very harmful effect on the patient.

Poisoning by Chloral Hydrate.—The taking of chloral hydrate becomes a vice with some people, and a "craving" for it seems to be established very quickly. In cases of chronic poisoning the chief symptoms are stomach and intestinal upsets, skin rashes, great heart and respiratory weaknesses, and general debility. The mind may be disturbed, and persons have been known to become permanently weak-minded. A slightly larger dose than the patient is accustomed to taking may be very quickly fatal.

Treatment consists of washing out the stomach or administering an emetic. The patient must be kept warm by means of hot-water bottles, hot blankets, friction and massage. An injection of hot coffee may be given into the bowel, and the patient should be prevented from going to sleep by flapping him with wet towels, and shouting to him. An injection of strychnine may be given.

CHLORIDE OF LIME.—Chloride of lime, or chlorinated lime, as it is sometimes called, is a white powder made by exposing slaked lime to the action of chlorine gas. This lime is a powerful disinfectant and bleaching agent, especially when mixed with an acid.

In order to disinfect drains or water-closets, about one pound of chloride of lime should be mixed with a gallon of water and poured down the drain; it also acts as a deodorizer to remove bad smells.

Articles of clothing may be disinfected by soaking them in a solution of 2 ounces of chloride of lime to a gallon of water and allowing them to stand for about 24 hours. To disinfect a room, mix some chloride of lime with water to which a little sulphuric acid has been added, place the mixture in a flat dish and leave it in the room for several hours. (*See also* Disinfection.)

CHLORODYNE.—This is a medicine used for relieving pain. It contains chloroform, dilute hydrocyanic acid, morphia and alcohol, as well as flavouring substances. It is used to produce sleep, especially if the sleeplessness is caused by pain. It is used in some cases of dyspepsia, but it should only be given in small doses, as large doses cause irritation and vomiting. The mixture should never be given to infants unless under medical supervision.

Doses repeated too frequently may lead to symptoms of poisoning which are very similar to opium poisoning. (*See also* Opium Poisoning.)

CHLOROFORM.—Chloroform is a colourless liquid, with a sweetish taste and a peculiar odour. It is largely used as a general anæsthetic. When breathed in it abolishes all sense of pain, and it is a particularly safe anæsthetic to give to young children or old people; but it must be given mixed with plenty of air and by a doctor who understands its administration. A mixture which is known as A.C.E., containing alcohol, chloroform and ether, is used a good deal instead of pure chloroform, especially for operations which require that the patient shall be unconscious for a long time. Chloroform put up in small capsules may now be had all ready for use in cases of childbirth; in this way the risk of an overdose is avoided.

It may be used as a local anæsthetic for toothache, the tooth being plugged with a piece of cotton-wool soaked in chloroform. Because of its sweet taste, it is very often used as a flavouring agent in order to disguise the nauseousness of other medicines. The compound tincture of chloroform and morphia acts as an anodyne; it is a similar preparation to chlorodyne. Chloroform may be used externally in the form of a liniment as a remedy for rheumatism, muscular rheumatism, and chronic inflammations. (*See also* Anæsthesia.)

CHLOROSIS.—Chlorosis, or "green sickness," as it is sometimes called, is a form of anæmia which occurs chiefly in young girls, though it has become rare in recent years, owing to the healthier lives they lead. A fuller description is given under the heading Anæmia.

CHOKING.—The treatment of choking is always a question of rendering first aid, and so is dealt with in the First Aid Supplement. It is also referred to in the article on Asphyxia. For simple choking caused by a piece of food sticking in the throat or some such accident, an adult may be struck on the back between the shoulders, smartly but not too violently. A very young child may be lifted by the toes and held upside down for a few seconds. If these methods are not successful, send for the doctor at once.

CHOLAGOGUE.—Cholagogue is the term applied to any substance which increases the flow of bile from the liver. (*See also* Bile.)

CHOLECYSTITIS.—This is the medical name for inflammation of the gall-bladder, and is described under the heading of GALL-BLADDER, INFLAMMATION OF.

CHOLERA, ASIATIC.—Cholera is an acute disease due to a specific organism known as the *cholera spirillum* or *Koch's bacillus*. The condition is characterized by very frequent watery stools, muscular cramps, suppression of urine and collapse. The germ is conveyed to man by means of infected water. Food and flies also act as carriers. Convalescent patients may act as "carriers," and occasionally persons in apparently good health, who show no symptoms whatever of cholera, may be "carriers," and by spreading the infection by means of their stools may prove a grave danger to the community. The disease occurs most frequently in India, China and other Far Eastern countries, but epidemics have broken out in Egypt, Europe and America. The incubation period varies from a few hours to 5 or 6 days, but on an average, symptoms appear about 3 days after the infection has taken place.

Symptoms.—Cholera may start quite suddenly, or there may be a few days of diarrhœa which gradually develops into a more severe condition. The stools quickly assume what is known as the "rice-water" appearance, and there is generally a marked state of prostration accompanied by severe cramps in the legs and abdomen. Vomiting of watery fluid and intense thirst may add considerably to the patient's misery.

The face at this time begins to develop a very pale and pinched appearance, the eyes are sunken and the expression is anxious. The skin loses its elasticity and becomes cold and clammy, the heart may become weak, and the pulse and voice very feeble. Symptoms of collapse may be very marked, and the urine may be suppressed and scanty. The patient may either die rapidly, or pass in a few days into the reaction stage. When the stage of collapse has passed, diarrhœa gradually diminishes, and the motions begin to lose their watery appearance and become more solid. The skin becomes warmer and the patient no longer appears pinched and blue or so anxious-looking. The heart improves and the urine output begins to increase. This reaction stage may be followed by rapid recovery, but sometimes a relapse occurs during the convalescent period, with a return of the diarrhœa. Severe complications may arise, chiefly during the reaction period.

Preventive Treatment.—In an epidemic, precautions should be taken to prevent the spread of the disease, and a certain amount of protection may be gained by boiling all water and milk, eating only cooked foods, and by avoiding all foods liable to cause diarrhœa. Vaccination will afford considerable protection for about one year.

Treatment of Symptoms.—As soon as there are any signs of diarrhœa, the patient should be put to bed at once, kept as warm as possible, and given small doses of opium. The violent vomiting and the intense thirst may be relieved by iced drinks. The body temperature must be kept up by means of warm blankets and hot-water bottles. The patient should drink water, albumen or glucose water in small quantities frequently. In cases where there is much loss of fluid from the blood, injections of salt solution are given into the veins. This is one of the chief modern advances in the treatment of cholera, and it has reduced the death-rate in some places to about one-half of what it was before. Potassium permanganate pills should be given every quarter of an hour for the first four hours, and then every half-hour until green bile appears in the stools. The administration of chalk has been highly recommended, and appears to do good. For the relief of the cramps, morphia may be given or chloroform may be inhaled. Champagne and brandy may be iced and given as a stimulant, and later, when vomiting ceases, liquid food may be administered in small quantities. During convalescence the diet must be increased very cautiously, and only dilute citrated milk, jellies and such-like bland substances should be given.

CHOLESTEROL.—Cholesterol or Cholesterin is the name of a substance which is present in the bile. It is found in the yolk of egg and in the blood. Gallstones are frequently composed of cholesterol. (*See also* BILE; GALLSTONES.)

CHOREA.—Chorea is more popularly known as St. Vitus's dance. It is chiefly a disease of childhood, in which there are irregular and involuntary actions of the muscles of the face and limbs. (*See also* ST. VITUS'S DANCE.)

CHOROID, THE.—The choroid is the middle of the three coats of the eyeball, and

lies between the white and the retina. In the front half of the eye it forms the ciliary processes, and beyond these, the iris. It is black in colour, and its use is to prevent "dazzling" and to ensure that objects are seen clearly.

Choroiditis.—When the choroid becomes inflamed, the patient complains that he sees everything through a mist. Objects appear distorted and altered in size; floating specks or "sparks and balls of fire" before the eyes may be noticed. The *causes* of choroiditis are many: syphilis; tuberculosis; many infections, including those from nose, throat and teeth, or chronic "poisonings" of the system; acute rheumatism; gonorrhœa; injury; eye-strain; increasing short-sight; and changes due to old age.

Treatment.—Except in syphilitic cases, where very prompt measures may bring about a cure, choroiditis is very difficult to treat. In septic cases, such as those due to wounds and acute infections, the whole eye may become so diseased that it must be removed. Eye-strain should be carefully avoided, especially in cases of short-sight and tuberculosis, when dark glasses should be worn. In old people—rarely before seventy-five—the disease occurs as a simple "wearing out" of the choroid. The patient has a central blind spot, but always retains sufficient vision to enable him to get about. No treatment will produce any benefit in these cases. In general, treatment is directed towards any possible *cause*, and attention should be given to the general hygiene. Tonics, such as cod-liver oil and iron, are often helpful, especially for children.

Tumour of Choroid.—The most usual tumour of the choroid is a sarcoma. The patient, who is usually over fifty, first notices that with one eye the side vision is almost gone, though he can still see well when looking straight ahead. Next, he becomes totally blind in the affected eye, and suffers a good deal of pain, which steadily increases. The tumour finally grows through the eye into the tissues at the back, and, as in other forms of cancer, secondary growths commence to form in other parts of the body, after which the patient soon succumbs.

It is sometimes difficult to distinguish between tumour of the choroid and simple detachment of the retina. (*See also* RETINA.) In any case, removal of an eye blinded by simple detachment is no great loss to the patient, but to leave an eye blinded by sarcoma will cost him his life. (*See also* EYE; EYEBALL.)

Choroid, Degeneration of.—This curious condition consists in the development of bone in the substance of the choroid. It occurs in people who have had a useless eye for many years; the eyeball is small, shrivelled, and sightless. The patient notices that the eye has become a little tender to the touch, and somewhat painful. The pain and tenderness may be due to the presence of the bony formation, or to bleeding from the diseased blood-vessels.

If the condition becomes really troublesome and painful, the eye should be removed; but no danger is incurred by leaving it in place.

CHYLE.—Chyle is the term applied to those ingredients of the food which, after passing through the stomach and being mixed with the gastric juices, are absorbed from the intestine, not by the blood, as is the case with the greater part of the absorbable ingredients of food, but by the *lymphatic glands*. The special lymphatics which deal with the absorption of chyle are called the *lacteals*, because of the milk-like appearance of their contents during the process of digestion. The parts of the food which are absorbed by the lacteals are the fats. The chyle is carried by way of the *thoracic duct* to the *left subclavian vein*, where it is emptied into the blood-stream. (*See also* BLOOD; DIGESTION.)

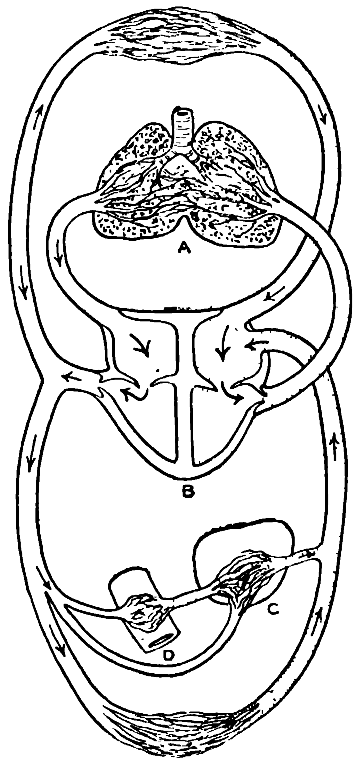
CHYME.—When food is swallowed into the stomach it is mixed with and acted upon by digestive juices of which the chief is hydrochloric acid, and the process of digestion begins. When the food is well soaked with the gastric fluid and has been thoroughly mixed by the action of the stomach, the valve at the lower end of the stomach opens and the stomach contents are passed on into the *duodenum* in a form called chyme. In the duodenum the chyme meets other digestive juices, and the process of digestion continues. The chyme is passed on from the stomach to the duodenum in small quantities which are propelled forward by the contractions of the stomach, so that by the time it reaches the duodenum it should be well mashed up into an easily-flowing stream. The chyme is acid.

CICATRIX.—The technical name for a scar. New scars are usually purplish or red,

but after a time they become white and glistening. (*See also* SCAR.)

CINCHONA BARK.—This name is given to the dried bark of the stem and branches of cinchona trees, of which there are several varieties. This bark was also known as Jesuit's bark, owing to its extensive use by the priests in the Spanish settlements of South America. It was first introduced to Europe by the Countess of Cinchon, wife of the Viceroy of Peru, in 1640. *Quinine*, as well as other powerful drugs, is extracted from the bark. The red cinchona bark produces the most quinine, and it is from this variety that preparations of the drug are made. Quinidine is another drug which is extracted from the bark, and it is considered to be almost as effective in the treatment of malaria as quinine itself. (*See also* QUININE.)

CINNAMON.—The dried inner bark of shoots of the cinnamon tree, which grows in Ceylon, yields an oil with a fragrant odour and warm, aromatic taste. Oil of cinnamon may be taken as a remedy for griping pains; one to three or four drops may conveniently be taken placed on a lump of sugar. In dyspepsia and also sea-sickness, powdered cinnamon may prove useful. The drug has a stimulating action on the stomach, and greatly assists digestion, hence its great value as a condiment.



CIRCULATION:
Diagram showing circulation, Arterial blood to the left, Venous blood to the right. A Lungs; B Heart; C Liver; D Intestine; Capillaries at top and bottom

CIRCULATION OF THE BLOOD.—The blood is circulated throughout the body by the heart and the blood-vessels. The different parts of the blood circulatory system are described in separate articles under the headings ARTERY, BLOOD, CAPILLARIES, HEART, VEIN. Only a brief description of them will be given here.

The *heart*, which is the central organ of the blood system, lies within the chest or thorax. It is a bag-shaped organ with a wall of muscle, and while the body is living it contracts at a definite rate, thus acting as a pump for pumping blood throughout the body. When this pump ceases its work the body ceases to live, and unless the heart's action is restored, death has taken place. The blood, pumped by the heart's contractions or beats, as they are called, flows into a system of long tubular vessels called *arteries*, and is carried by them to every part of the body. These arteries are branched in every direction to supply the limbs and outlying parts of the body with blood. Their branches are again branched, and so on until the smallest arteries are reached. These end in tiny vessels called *arterioles*, and the arterioles open into a net-work of infinitesimally small vessels called *capillaries*, which are only visible under a microscope. By the time the capillaries are reached the blood-stream has absorbed the oxygen from the air breathed in and nutriment from the various organs of the body where it is manufactured, and by means of the capillaries this nutriment is passed into the tissues of the body, and thus they are fed and enabled to carry on their work. The capillaries, as well as passing out nutriment into the tissues, collect from the tissues the waste materials which must be removed from the body in order to keep it in health. These waste materials pass from the capillaries to tiny vessels called *venules*, which are in the same relation to the *veins* as the arterioles are to the arteries. The venules flow into the smaller veins, and the smaller veins join on to the main veins in a similar system to that of the arteries. By the veins, therefore, the bad blood containing the waste

materials not required by the body is carried to the heart. This system of blood supply by the arteries and blood collection for return to the heart by the veins is known as the systemic or greater circulation of the blood. There are, however, two minor circulations.

In the lesser or *pulmonary circulation*, the venous blood enters the heart at the *right atrium.* From this cavity it is carried to the *right ventricle*, and from it is passed along the pulmonary arteries to the lungs, where it circulates throughout the whole tissue of the lung in the capillaries, giving off carbonic gas and other noxious substances which are exhaled by the lung, and receiving oxygen. After circulation through the lungs the blood, which is now reoxygenated, purified and turned into arterial blood, passes back through the *pulmonary veins* to the *left atrium* of the heart, whence it passes into the *left ventricle* and out into the systemic circulation again.

The other lesser circulation is that of the blood which circulates through the spleen, pancreas, stomach, small intestine and the greater part of the large intestine. This blood is not returned directly to the heart from these organs, but is carried by the *portal vein* to the liver, where it percolates in the small vessels of the liver, discarding toxic substances and leaving the organ by the *hepatic veins*, whence it is passed to the *inferior vena cava*, which conveys it to the *right atrium* of the heart.

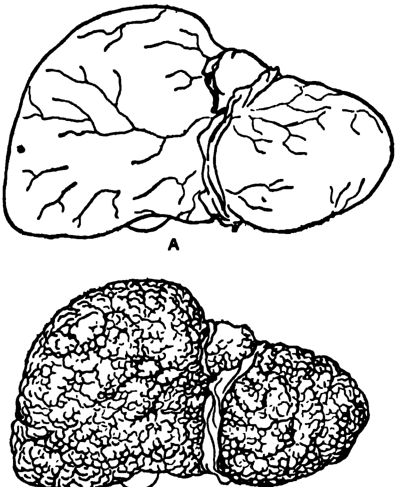
The function of the circulatory system of the body is to convey to the tissues the fluid called blood, which contains the nourishment required to keep the body alive and in working order. This nourishment consists of oxygen obtained by the lungs from the air and nutritive substances obtained from the food. The way in which the nutritive substances are absorbed into the blood is described elsewhere. The second function of the circulatory system is to remove from the blood the impurities which it has absorbed from the system during its journey through the body. Two distinct sets of blood-vessels are used for these purposes. The arterial system conveys the pure and nutritive blood throughout the body and the venous system returns the impure blood to the heart. The heart serves the double purpose of dispatching the arterial blood on its journey round the body and receiving back the impure blood, and also of dispatching the impure blood on its way to the lungs for purification and receiving it back for restoration to the main circulation.

CIRCUMCISION.—Circumcision consists in the operation of the cutting off of the foreskin of the penis. This is quite a simple affair in baby boys, without any danger attaching to it, and is practised as a religious rite by Jews and Mohammedans. Among other people circumcision is usually done only when the foreskin is abnormally tight, but it would not be a bad thing if every male child were circumcised as a hygienic measure. In the infant the operation is so slight that the child may run about as usual immediately afterwards, but in the adult the parts are so much more developed that 48 hours in bed will be required and restricted activity for a few more days.

CIRRHOSIS.—When the tissues of an organ have been chronically inflamed for a long time they may become fibrous and hard. This condition is known as *cirrhosis.* The organ which becomes *cirrhotic* is hindered in the carrying on of its work. The liver, kidney, heart and spleen are the organs chiefly affected, of which the liver is the most usually attacked.

CIRRHOSIS OF THE LIVER.—This often goes by the names of "gin-drinker's liver" and "hob-nailed liver"—in the former case because of the belief that it is caused by the consumption of too much alcohol, and in the latter, because the liver shrinks and develops a hard, knobby surface. Although it is undoubtedly true that too much alcohol is a factor causing cirrhosis of the liver in some cases, it is no longer held to be the only or even the main cause, since cirrhosis may occur in cases in which alcohol has played no part, as in the case of young children and in races like the Hindoos who do not take alcohol. It is thought that cirrhosis is frequently caused by the action of the common germs such as those which normally inhabit the bowels. They settle in the liver and cause a long chronic low infection of the organ. Or chemical irritants from a diet which is habitually rich in highly spiced foods such as curries may be absorbed by the liver and cause cirrhosis. It is believed that certain metallic poisons, particularly lead, will bring about this condition. The liver becomes

congested with blood, first becomes very much enlarged, and then begins to shrink and harden. In some cases, however, it does not shrink, and has much the same appearance as a liver that has undergone fatty degeneration.



Cirrhosis of the Liver
A. Normal Liver B. "Hobnailed Liver"

Symptoms.—The majority of the sufferers from cirrhosis of the liver are males over forty, and it is more common amongst those working in the liquor trade and amongst commercial travellers than in other occupations. The patient usually has a feeling of discomfort in the pit of the stomach, with nausea, indigestion, sickness and vomiting. There may be bleeding from the stomach, the blood being either vomited or passed through the bowel. The patient sleeps badly, and very often looks thin and slightly yellow-faced. The urine becomes scanty and turbid, and dropsy with distended abdomen and enlargement of the legs are very often present.

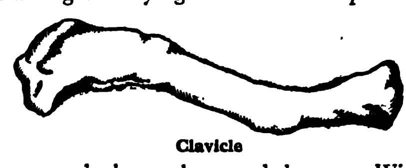
Treatment.—The diet should be of the lightest description, and meat should not be eaten. Fish, milk puddings and milk soup should form the greater part of the meals. The bowels must be kept open, and bicarbonate of soda should be taken daily in warm water to relieve the feeling of nausea. Treatment can only aim at relieving the symptoms, since once the liver has become cirrhotic, nothing can be done to bring it back to its original state. No alcohol must be taken, and the patient should take as much exercise as possible. (*See also* DROPSY.)

CITRIC ACID.—This acid is to be found in lemons and oranges, and they owe their sharp flavour to it. The acid may be extracted from these fruits in the form of colourless crystals which are very easily dissolved in water; ·35 grs. to 1 fluid ounce of water will make a solution the same average strength as lemon juice. It is greatly used to provide cooling drinks, especially in cases of fever. An effervescing drink may be made by placing 20 grains of citric acid and 25 grains of bicarbonate of soda each in half a glass of water; sugar may be dissolved separately, and the three ingredients mixed together in a large tumbler just before drinking. This drink is particularly soothing for those suffering from an irritated stomach. Citric acid is also used to correct acidity of the stomach, as on absorption into the blood it is changed into an alkaline substance. It has been given internally in the treatment of rheumatism and jaundice.

CLAUDICATION, INTERMITTENT.—This is a form of intermittent lameness associated particularly with arterio-sclerosis, though it may occur temporarily in other diseases which have a weakening effect on the walls of the arteries. The patient will feel intense pain in the legs after walking for a short time and will have to stop. Immediately he sits or lies down the pain ceases, only to return again when walking is resumed.

CLAUSTROPHOBIA.—Dread of being shut up in an enclosed space such as a room with the door shut, or in a crowd. This nervous dread is sometimes felt by persons who are the victims of neurasthenia. Such people may find it almost impossible to bring themselves to go into the carriage of a railway train or into a theatre or cinema. The opposite state, of being afraid of wide open spaces, is called agoraphobia. (*See also* PSYCHOTHERAPY.)

CLAVICLE.—The collar-bone, or clavicle, is a long bone lying in a horizontal position



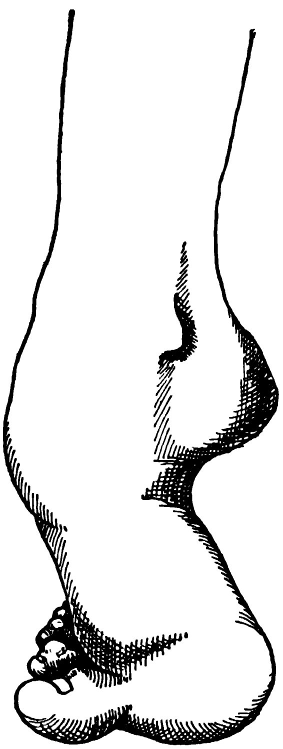
Clavicle

between the breast-bone and the arm. With the *scapula* it forms the shoulder. The collar-bone gives width to the shoulders and supports the arm, which joins on to its end

at the tip of the shoulder and is thus held free of the body. It is very liable to be broken, especially by falls in which the individual puts out his hand to save himself and thereby receives a severe blow on the hand. Fortunately, however, the break is usually only a crack which stays in position, and is easily healed.

CLAVUS HYSTERICUS.—A pain in the head felt by hysterical or neurasthenical people, who say that they feel as if a nail were being driven into their heads. (*See also* HEADACHE.)

CLAW FOOT (*Pes cavus*).—A deformity of the foot in which the arch of the foot is very much exaggerated, so that the balls of the toes are brought near to the heel. The condition is seldom present at birth, but is usually due to some form of spinal disease. The very high instep makes it difficult to obtain suitable boots, and corns and callosities form easily. There may be severe pain in the instep. In early cases the condition may be corrected by putting the foot in plaster of Paris in a position to correct the deformity, followed by massage and exercises and the wearing of special boots.



Claw Foot (*Pes cavus*)

CLEANLINESS, PERSONAL.—Year by year, a higher standard of personal cleanliness is noticed. This is not the place to delve into the unsavoury past, but it may be noted in passing that King James I had a skin as soft as silk because he never washed, and that Queen Anne, a hundred years later, showed an advance in cleanliness by washing her *hands* every morning. One hesitates to think of the habits of other classes, if these were the customs of royalty. The widespread practice of making and using perfumes was probably, in those times, not so much to add to personal attractiveness as to conceal personal odours. In these days, when the daily bath is becoming a settled habit, among a large proportion of the community, a far greater interest is taken, not only in actual cleanliness, but in what might be called the theory of cleanliness.

It is generally recognized now that the skin, in addition to its other functions, acts largely as an *excretory* organ. In its substance are contained innumerable sweat glands, whose openings lie on the surface, and through which—even when no exercise is taken—nearly 1½ pints, or 30 ounces of perspiration pass in the course of the twenty-four hours. During exercise, as everyone knows, the skin is more active, and when stimulated, as by a Turkish bath, as much as 6 pints may be lost. The sweat consists mostly of water, but contains also salt and various fatty acids and fats, chiefly waste products of the body. *Sebaceous glands*, which produce the *sebum* or body-oil for the skin and hair, are also present over the whole surface of the body, except the palms and the soles.

The skin, therefore, is constantly exuding perspiration and oil, and shedding scales from the skin and the scalp. These accumulate on the skin surface, and partially penetrate into the underclothing worn next to the skin. It follows, therefore, that the skin must be frequently cleansed, and the under-clothing periodically changed, if the person is to be clean and wholesome.

Moreover, a dirty skin and dirty clothes are not only offensive to one's near neighbours, but are definitely injurious to the health of the person who suffers them. The pores of the skin, being partially blocked by the accumulation of decaying matter, cannot act as freely as they should, with the result that more work of excretion is thrown on the kidneys. If, as frequently happens, the skin is scratched or chafed, this foul matter may cause infection by absorption into the lymph vessels of the skin, and these and their neighbouring glands may become inflamed. An example of this is seen in children with lice-infested heads, where the glands at the back

of the neck are frequently found swollen and inflamed. Uncleanly people commonly "suffer from the cold" far more than those who have frequent baths, the reason being that the salt in the sweat remaining on the skin takes up moisture from the air; the skin becomes damp; heat is given off from the surface of the body (damp being a good conductor of heat), and the person feels chilled.

Some people have the idea that by having a *cold* bath every morning they have therefore cleansed their skin of impurities; this, however, is a mistake. The matter upon the skin is mainly of a fatty nature, and it is common knowledge that cold water will not dissolve grease. Hot, or at least, warm water, soap, and friction are all necessary to ensure true cleanliness of the skin. The hotter the water the more readily is the fat dissolved. Soap acts chemically upon the fat and so assists in its removal. Soap is made up of an alkali and a fatty acid. The alkali combines with the grease on the skin (practically forming more soap), and so enables it to be readily washed off with water. Chemically, no fatty acid is necessary; but, practically, the alkali used alone would be too drastic, removing almost all the oil from the skin and thus causing it to be cracked and chapped by this drying action. Everyone who uses fairly strong alkalis, as for instance, in washing-powders, knows this effect by practical experience. Cheap toilet soaps, and most of the "household" varieties, contain more or less free alkali, which, though quite satisfactory for cleansing purposes, is very injurious to the skin. This effect is especially seen, naturally, when the skin is "tender," either constitutionally, or in cold weather when it tends to be drier, or in very young or very old skins. A "superfatted" soap—a term frequently applied to good toilet soaps —contains no free alkali and is suitable for these types of skins. The skin is cleansed quite effectively, and a sufficient amount of lubricant remains to prevent damage. The use of superfatted soaps in this manner might be compared to the use of oil in anointing the body in tropical and arctic countries, to protect the skin from the extremes of hot sun and intense cold.

Friction is applied to the skin by the hands, loofah, rubber sponge, and so on, and finally by a towel. A rough bath towel should be used, as this removes the dead scales from the skin, increases its circulation, and thereby improves its health and appearance.

Even if the whole body cannot be washed daily, the feet should always be washed. The glands of the feet are always very active, even in the coldest weather, and this sweat, together with the dead scales, rapidly gives off an offensive odour if not removed. Other "active" parts are the armpits, the fork, and the space between the buttocks; these likewise should have a daily wash.

The question is frequently asked: "Should baths be taken during the menstrual period?" To which the answer is a very decided "Yes." Cleanliness is, perhaps, even more important at this time than during the inter-menstrual period. Cold baths may be left off if, by increasing the internal congestion, they cause more discomfort, otherwise they do no harm. A hot bath, however, is not only more cleansing, as has been seen, but is very helpful at these times in relieving pain and discomfort.

The hair should have frequent washing; its nature should be considered (*see also* HAIR, CARE OF), but generally speaking once a week or a fortnight is quite long enough between each shampoo. After a visit to the hairdresser, unless a shampoo is taken there, the hair should *always* be washed. It is very seldom indeed that the combs, clippers, and other instruments used by a hairdresser are cleansed, much less disinfected, after use. Not only is this a very uncleanly custom, but it is well known that many diseases are passed on in this way. Hair-brushes and combs should be as much one's private property as a tooth-brush. They should be washed twice a week, or at least as often as the hair is washed. The hat-lining, too, should be regularly cleansed.

The nose is often neglected by otherwise cleanly people. It should be carefully cleansed at least once a day. This is generally done only in cases of disease, when syringing is ordered, but it is very necessary. The nose is a most useful organ, and does a great deal of dirty work in filtering the dust, soot, and germs from the air before it enters the lungs. Like other filters, it must be kept clean if it is to do its work well. The simplest method is to give it a good "blow," then clean it with a soft handkerchief dipped in warm water. This should be done gently, or the mucous membrane of the nose will be

damaged. A clean nose is far more able to resist infection than a dirty one, and probably if the nose were washed out daily, there would be far fewer colds and such diseases.

The eyes and ears require little special attention. Wax in the ears is removed by the aid of soap and water, *never* by the introduction of foreign bodies, such as hairpins. The ear is readily damaged in this way. If the wax cannot be removed, a doctor's advice should be asked before syringing the ears. The eyes should *never* be dried with another person's towel, especially if he is suffering from any disease. Many eye diseases are contracted in this way.

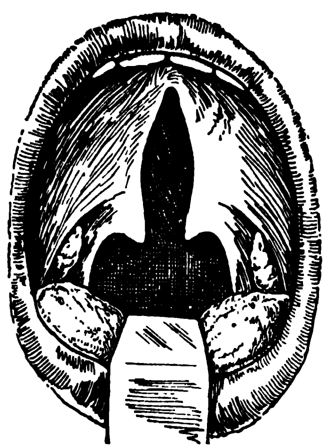
The teeth should be regularly and thoroughly cleansed; and the bowels kept clean by suitable diet and regular motions. Teeth and bowels are fully dealt with elsewhere.

The underclothes should be changed as frequently as circumstances allow. It is not possible, for economic reasons, for the majority of people to have a daily change, much less to emulate the man who suffered from a sense of intolerable uncleanliness unless he changed his shirt thrice daily. Neither is it necessary to wear one's clothes so long that they are obviously dirty and offensive. None of the day clothing should be worn at night: it is not uncommon, for instance, for children to wear the same vest day and night: and both day and night clothing should be thoroughly aired before further use.

The outer clothing should be cleaned from time to time: it is extraordinary how long some "clean" people will wear overcoats, suits and so on, without cleaning them.

Persons whose skin and clothing are dirty are very attractive to lice and other parasites. (*See also* PEDICULOSIS.) On the other hand, both lice and fleas dislike cleanliness, especially if scented soap or other scent is used. Head and body lice are easily transferred from person to person by contact, or by the wearing of lice-infested clothes and hats; the latter mode of infection is common when children "change hats" at school. Cloakrooms becomes infected, so that from one dirty garment left there, even for a short time, lice may pass to many others. Hair-brushes and combs, when used in common, are very frequent sources of infection by head-lice.

CLEFT PALATE.—The palate or roof of the mouth is formed by two plates, of bone in front and muscle behind, which normally join together in the middle line of the roof of the mouth. Occasionally, however, a child is born in whom the two sides of the roof of the mouth do not completely join up, with the result that a gap is left. This condition is called cleft palate, and if left untreated will cause great difficulty in feeding and speaking. The only way to close the gap is by operation which should be done in early childhood, preferably during the first three months of life. If the gap cannot be closed by operation a specially prepared dental plate should be worn.



Cleft Palate

CLERGYMAN'S THROAT.—Clergyman's throat is a chronically inflamed condition of the structures at the back of the throat. It is called "clergyman's" throat, but might as well be called teacher's or actor's throat, as it is in most cases found in people who use their voices in the pursuit of their daily work. The mucous membrane at the back of the throat is dotted with little dark red spots varying in size from a pinhead to a small pea. There may be a dry irritable cough and the voice becomes husky and weak.

Treatment.—The treatment consists in rest of the voice, and a tonic treatment for the general health. As a temporary alleviation a good variety of throat pastille may be sucked at intervals. The well-known throat paint called Mandl's paint, which contains iodine, is a useful application to the throat. All unhealthy conditions of the nose and throat, such as enlarged tonsils, or deflected *septum* in the nose, must be attended to, and as the condition will recur when the voice is used again if the condition was originally due to faulty

production of the voice, lessons in voice production and breathing should be taken.

CLIMACTERIC.—Climacteric or menopause are medical names for what is commonly called by women the change of life. It may occur at any age between thirty-five and fifty-five, according to the type to which the individual woman's family belongs, and the process usually takes a couple of years. A full account will be found under the heading CHANGE OF LIFE.

CLIMATE AND ITS RELATION TO DISEASE.—It is comforting to be told that if our lives are to be lived in a temperate climate—that is to say, neither very hot nor very cold—a temperate *island* climate is the best. So we cannot do better than live in the British Isles. True, there may be a good deal of rain, but that is all to the good, because it cleanses the air. And is it not wise, anyway, to make the best of it, and not grumble too much at our climate even though it may spoil a cricket match.

After all, we are much better off for climate than are people whose work takes them to countries where the air is heavy with moisture from marsh or jungle, where dysentery, yellow fever, cholera, malaria, liver troubles and other lowering illnesses are common, although we must not forget that even in those tropical countries which used to be called the "White Man's Grave" there have been vast improvements of late years. For it was found that some of these diseases were carried by mosquitoes and flies—which as we all know are dirt-carriers, and may easily be disease-carriers even in our own country. And by chasing these pests out of their haunts it has been possible to clear many parts of the world from the fevers that formerly made them impossible for white people to live in and unhealthy for any race of human beings. For example, by getting rid of the mosquitoes, Americans have been able to free Cuba and Havana from the fevers which used to be such a terrible plague; and where North America joins South America, the narrow strip of land through which the wonderful Panama Canal was cut, formerly a fever-ridden district, has now as low a death-rate as many average American cities. The clearing of that vast area, when the Canal works employed thousands of skilled workmen, was a triumphant engineering feat.

Hot climates.—The countries lying on or near the equator are hot. Some, like Central Mexico, are hot and damp; others, like Central India, are hot and dry. The hot damp climates are not nearly so healthy as the hot dry ones; but even there, liver complaints and bouts of malaria have always been a drawback to people going out to trade, explore, or fill civil or military positions, or to do medical or missionary work. They have to be sent home every few years on leave, and children are sent home at an early age.

Cold climates.—Affections of kidney and chest are what we have to face if we settle in a very cold country, but on the whole there are fewer illnesses to fear than in hot parts of the world. Even in this country we know how clear frosty weather is the best cure for an influenza epidemic.

Temperate climates.—Ocean streams and currents, as well as the nearness of the sea, are very important in their influence on the climate; so are rivers, which sometimes bring down vegetable matter and deposit it on the banks; trees, soil, rainfall, winds, and a variety of other conditions into which there is not space to enter here. But we may say that Scotland, which any Scotsman will tell you has a splendid climate if not the best in the world, is in much the same position with regard to the "line" as Labrador, where one travels over miles of ice and snow in dog-sleighs. One reason why Scotland is not so cold as Labrador is that the warm Gulf Stream washes its western shores, as it does also the coast of Cornwall.

Seaside and ocean.—People recovering from severe illness or operation, those with enlarged glands, or those worn out by business or other anxieties, often benefit greatly by a stay at the seaside. Wounds heal better; brain and muscles "buck up"; sleep is refreshingly sound. Where long, complete rest is needful, or in early cases of tuberculosis, an ocean voyage is sometimes ordered by the doctor.

Low-lying inland climates.—People living in valleys have their own difficulties to face. There is a great difference between the temperature of summer and winter. There are no sea-breezes; the air is often heavy; in some parts "Derbyshire Neck"—goitre—is prevalent; but in some valley places there are valuable mineral springs which attract numbers of rheumatic or gouty patients.

Mountain climates.—Whatever illnesses the people living in mountain climates may

suffer from, it is not likely to be malaria or tuberculosis—unless they are there for the cure of this disease—but they may suffer from heart complaints. Mountain climates are not good for the aged, or for those with heart or kidney disease. The air being thinner—*rarer* is the correct word—the pulse is faster and we breathe more quickly. Also, we have "that buoyant feeling" which makes it easy and delightful to walk many miles on a mountain holiday when, at home, one or two would tire us out. The air is dry and not laden with germs. The sunshine is plentiful during the day and there may be frost at night. Sudden snow-storms are likely to come on, alternating with brilliantly hot sunshine. Tuberculous patients and children who have outgrown their strength are often sent to Switzerland for the sun, and children lying out of doors with very little clothing become brown as berries in a short time. Similar treatment is carried out at some of the children's hospitals in this country.

Extra-dry and desert climate.—Have you ever wondered why the mummies in our museums have lain for so many centuries in Egypt without losing the bright colours painted on their outer cases? The dry pure air that is good for the preservation of mummies is good also for lung disease where there are places in the lungs requiring to be healed; the dust of the desert, however, and the night chills must be avoided. Other cases that do well are chronic rheumatism and kidney troubles. Patients needing this kind of climate are sometimes advised to go to South Africa.

When we speak of climate, we mean not only the weather but what causes the weather—the conditions of the air, position of the country, and those other circumstances of which we have spoken. Some climates, as we have seen, produce certain illnesses; some are good for one class of ailment, some for another. But even more important than climate are the conditions under which we live—such as housing, diet, habits; all these tell when illness comes.

In one respect medical opinion has changed very much during the last half century. Whereas formerly tuberculous patients used to be kept in heated rooms and sent to warm climates, they are now encouraged to sleep out of doors in all weathers and given as much fresh air as possible. Even children now sleep in the open in the coldest weather, and out-of-door schools show how hardy it is possible to become, even in so changeable a climate as our own.

CLINICAL.—This term, which comes from the Greek, means literally a bed, and the word is used in connection with the bedside treatment of a disease. A *clinician* is a doctor whose opinions and teachings are based upon experience gained at the bedside of his patients. The term *clinic* is used to denote a place where medical instruction is given in the presence of the patient whose symptoms are studied and whose treatment is considered. A *clinical* thermometer is one which is used when taking the temperature of a patient.

CLOT.—A solidification of the blood. In normal persons the blood clots on exposure to air at a perfectly definite rate of time, and this clotting time is useful as a test of the state of the blood. An abnormal clotting of the blood while in a blood-vessel is called *thrombosis*, and "clots" at the menstruation periods and after childbirth are common.

CLOTHING.—At a very early date man, with his scanty hair covering and thin skin, became envious of the natural garments of other living beings, and stole from them to clothe himself. His first clothes were doubtless fashioned from the skins of beasts he had slaughtered for food; but later he became proficient in weaving, and there is historical evidence to show that wool, camel-hair, silk and linen fabrics have been in use for many thousands of years. The history of cotton does not go back so far, but even this was known in India some time before the Christian era.

Nowadays, the majority of garments are made of cotton, linen or rayon (frequently called "artificial silk") from the vegetable kingdom, and wool and silk from the animal. Furs, feathers and leather are also used for special purposes. These materials may be used pure, or as a mixture.

Cotton, which is obtained from the fluffy covering of the seeds of the cotton plant, can be woven into fine, smooth and very durable materials. It is only very slightly shrunk by washing. It is unsuitable for undergarments in cold countries, as it soaks up the perspiration and remains moist, and this moisture is rapidly evaporated with much loss of heat, so that the body

soon feels chilled. Cotton is a good conductor, which signifies that the heat of the body is rapidly conducted away and dissipated. Air, on the other hand, is a bad conductor, so that cellular cotton, which contains many air spaces, is a far warmer material than ordinary cotton.

Cotton, however, makes very clean-wearing outer wear, as dust, dirt and germs in the air cling far less readily to it than to rougher materials; it is also easily washed. It has therefore been chosen as uniform wear for those in occupations which involve undue exposure to dirt and infection, such as hospital and nursery nurses, housemaids, librarians, mechanics, and so on.

Flannelette, which is a cotton material whose surface has been rendered fluffy so as to include more air, is also much warmer than smooth-woven cotton, and because of this and its cheapness as compared with wool, has been very largely used. Unfortunately, this fluffy material is also very inflammable, and has been responsible for the loss of many lives by burning. As a result, much flannelette is now rendered non-inflammable by soaking it in certain chemicals, such as a solution of alum, but it should be noted that washing gradually destroys this power, so that the flannelette in time returns to its inflammable state. There are many other similar materials, which it would be impossible to name in detail, but they are all inflammable in proportion as they are fluffy.

Linen, which is obtained from the fibres of the flax plant, gives a finer and smoother material than cotton. Its properties are the same as those of cotton, except that it is an even better conductor of heat, so that it is also not very suitable for winter underclothing. Linen and muslin may be rendered non-inflammable by a "fire-prcof starch," but this, as in the case of flannelette, is partly removed by washing.

Wool, which is derived from the fleece of sheep and similar animals, is most valuable for clothing. It absorbs and retains the perspiration, and is a bad conductor of heat, so that it is very suitable for underclothing. It is practically non-inflammable, as it only smoulders without catching fire. It produces warm materials partly because of the comparatively large amount of air contained in the spaces between the fibres, partly because the fibres themselves contain a large amount of natural oil in their substance. This, however, varies a good deal with the process of manufacture; if this is carried out carelessly, much of the oil is removed and the wool is harsh, wears poorly, and is not nearly so warm as well-manufactured material. Bleaching, for instance, may remove the fat; hence a good deal of unbleached or natural wool is used for underclothing. Again, woollen garments should be washed very carefully, or the oil will be removed. Washing in very hot water, or with strongly alkaline soaps, will dissolve out the oil and shrink the fibres, and a good woollen garment will be rendered no better than a cheap one. As wool readily absorbs the perspiration, which consists not only of water-vapour but of materials given off from the body, woollen garments need frequent washing. Soft, warm (not hot) water should be used; no soda, but a good soap: superfatted soap is the best, and although the cost may seem too great, it is after all not so great as replacing garments. The garment should be squeezed, or put flat through the wringer before drying, not wrung in the usual manner, as this twists and breaks the fibres. Paraffin or kerosene soap assists in the removal of dirt and grease from the clothes, and they require much less rubbing and wringing, but the drying must be done out of doors, or the odour of the soap will be retained. This is especially necessary when a kerosene soap is used. Drying out of doors is by far the most preferable method, as sunlight and dry air kills off any germs which may be present, bleaches the clothes, and (in the case of wool) prevents the removal of the oil which occurs when the garments are dried before a fire.

Wool is made up in many ways both for outer clothing, as in tweeds and flannels; and underclothing, as in flannel and woven materials. It is also knitted by hand into various inner and outer garments. The closer the weave, the warmer is the material; but woollen materials, unless very thick and closely woven, are not suitable for outer wear in cold and especially windy weather. The popular "woolly sets," so much used by "toddlers" in winter, and consisting of a cap, coat, and pull-on leggings of loosely woven or knitted wool, are unsuitable for wear out of doors, except in fairly mild

weather. They have no wind-breaking power at all. Doubtless if "woolly sets" declined in popularity, the high death-rate among small children for bronchitis, broncho-pneumonia, and other such diseases would also decline. Children, as well as adults, should in cold weather wear a coat sufficiently closely woven not to allow the wind and cold air to penetrate to the skin, and in very cold weather cloth leggings may be added.

There are numberless wool-and-cotton materials also used for inner and outer clothing, Viyella and wincey being well-known examples. "Shoddy" is the name given to old wool and cloth material which has been remanufactured. To some persons with peculiarly sensitive skins, wool causes irritation or even dermatitis; in these cases a silk or cellular cotton garment should be worn next to the skin, and the woollen garment over this.

Silk is obtained from the cocoon of the silk-worm, and has advantages and disadvantages for underclothing. It is a very bad conductor of heat, so that it is both warm in winter and cool in summer; it is cleaner in wear than wool, and far more easily washed, shrinking very little. If exposed to fire, it burns very slowly. On the other hand, it is much less absorbent than wool, so cannot hold the perspiration to the same extent; it is comparatively expensive, and not nearly so durable as either wool or cotton.

Rayon, or "artificial silk," is obtained from wood-pulp. It is now very largely manufactured under various names, and in many instances is taking the place of silk. Its properties are similar, but it is both cheaper and more durable than silk. It is important to health to note that both silk and rayon allow the ultra-violet rays of the sun to pass, whereas wool and cotton do not.

Fur, leather, and waterproof materials are all very valuable as outer garments when the weather is cold, windy, or rainy. Leather and oilskins are especially valuable, as they are almost entirely impermeable, and so are excellent wind-breakers. This impermeability, however, acts both ways, and so prevents ventilation of the skin by causing stagnation of the air between the skin and the coat. This is quickly realized if a waterproof garment is worn in warm weather; this discomfort soon becomes very great.

Dyes used for colouring materials sometimes produce a troublesome dermatitis. Aniline dyes, which are very commonly used, sometimes contain arsenic, which is irritating when applied to the skin. This harmful effect is perhaps most often seen on the feet and legs, when stockings coloured with an aniline-arsenic dye are worn. The warmth and moisture of the feet appear to hasten the action of the arsenic. Furs, too, are sometimes a cause of trouble when dyed. The dermatitis (irritation of the skin) occurs most often on the back and sides of the neck, and the chin, where the fur collar rubs the skin, very occasionally on the wrists. As in these cases the only cure is to discard the fur, it is best to get a guarantee from the furrier that the dye used, if any, is harmless.

Considering all these qualities then, the ideal material for clothing must *protect* the body against both cold and heat, in virtue of its property as a bad conductor; it must be *non-inflammable*, or as nearly so as possible; it must be *permeable*, so that the skin is well-ventilated; and it must *not irritate* the skin.

The Warmth of Materials and Colours.—Clothing gives warmth, not in itself, but in proportion as it can retain the natural heat of the body. The materials mentioned, in order of warmth, are wool, fur and down, silk, cotton and linen. It must also be remembered, however, that this property does not altogether depend on the material itself, but also on other factors. Garments worn loosely are warmer than tight garments, because of the thicker layer of air between them. Several thin garments worn in layers are warmer than a single garment of the same weight, for the same reason. The colour of the outer clothing is important, as each colour has its own heat-absorbing power. These, in order, beginning with the greatest, are black, dark blue, light blue, dark green, turkey red, light green, dark yellow, pale straw and white. Rough materials are warmer than smooth ones, as they increase the circulation in the skin by their slight constant friction.

The absorptive power is very important in determining the warmth of a material, as this allows perspiration to be absorbed from the skin, and it is evaporated from the garment, not from the skin itself, so that the chilliness produced by direct evaporation is avoided. This power is very important from

the point of view of health. After exercise, for instance, a cotton garment quickly becomes damp and cold; wool, on the other hand, remains warm and dry, and prevents chilling of the body surface, which is very dangerous. In hot climates especially, wool should be worn next to the skin to prevent a chill, which may lead to dysentery, ague, and other troubles. Wool has the greatest absorbing power, then fur, down, silk, linen and cotton; and odours are absorbed in the same order.

The clothing, to be suitable and healthy, must preserve the whole of the body at a uniform temperature. As a general rule, too much clothing is worn, especially by men, and by the unfortunate children of a too-fond mother. It is even more objectionable to health than too little; the over-clothed person is apt to be much affected by the cold, and to be prone to coughs and colds, and other affections of the respiratory passages. On the other hand, the dress of women and children offends chiefly against uniformity of temperature—the body is warmly clothed, but the extremities far too thinly clad. Exception has already been taken to "woolly sets"; no less distressing in winter weather is it to see small children in a thick coat, but with a lengthy expanse of cold blue leg between thin socks and short knickers. These extremes are bad both for the health and the appearance. Children should always have long warm woollen stockings in cold weather, regardless of fashion. The present popular custom among women of wearing woollen tennis-socks over the stockings has much to commend it. The "hardening" of children should proceed cautiously; the middle course between swaddling and over-exposure is better than either. In warm weather the clothing may be reduced to a minimum, provided chills can be avoided.

Children's Clothing.—At the extremes of life, *warmth* of clothing is the great essential. Little children lose heat rapidly and are liable to take cold, partly because, as their circulation is more rapid than that of the adult, more blood is carried in the same length of time to the skin vessels, and so more heat is given off from the skin. Also, in children, the skin surface is larger in proportion to its contents than is the case in adults. In infancy, the clothing should be warm but not heavy and uncomfortable, and readily washable. (*See also* LAYETTE in the SUPPLEMENT ON BABY.) Wool, unless irritating, or flannel should be worn next to the skin by both infants and growing children.

Clothing in Old Age.—In old age, as the vital processes decline and the circulation becomes feeble or languid, the function of heat production and regulation is lessened, and the temperature of the body tends to fall. If chill ensues, restoration to the normal temperature is slow and uncertain. As in the very young, the clothing should be warm and light, as heavy clothes are just as burdensome to old people as to little children. Woollen or flannel garments are again the most advisable in their case, and extremes of temperature should be as far as possible avoided.

Clothing should be changed according to the weather.—The clothing should be changed according to the weather, not the calendar. There was formerly a custom, still lingering in the poor quarters of large towns, of "sewing in" the children for the winter. When the careful mother thought the season far enough advanced, she arrayed her children in all the warm underclothes they possessed, and sewed the garments firmly together on the children. Whatever the temperature, the little unfortunates remained *sewed in* till the following spring.

The clothing should not interfere with any natural functions or movements, so as to lead to injury or mal-development of that part of the body which it covers. The collar should not be too tight, as the neck contains many important vessels which are liable to suffer from pressure. The waist and the feet have probably suffered most from tight or ill-fitting coverings, and are important enough to be discussed in separate articles. (*See also* BOOTS AND SHOES; and CORSETS.) Garters, especially for children, should be avoided, and suspenders worn instead.

Night Clothing and Bedclothes.—The night clothing should be of woollen material in the winter, and of silk, rayon or very fine wool in the summer. The bedclothes should be as light as possible, provided that they are reasonably warm; it is far better in cold weather to use a light *ventilated* eiderdown or feather quilt than to pile on additional blankets. Feathers, like wool, are warm both because of their natural oil and the

amount of air they contain. Recently, blankets containing wide air-spaces have been manufactured, and these, except for their expense, approach the ideal bed-covering for warmth and lightness. The mattress should be of hair, which is the most expensive, or wool, or a mixture. A few good vegetable substitutes for hair are now obtainable. Feather beds are unhealthy, as they press so closely on the body as to interfere with the ventilation of the skin and thereby produce over-heated and restless sleep.

Bed Warming.—Much ill has been spoken of hot-water bottles and other foot-warmers; probably far more than they deserve. It is



Club-Foot

a mistaken policy for the young and healthy to become so accustomed to these and other forms of comfort that they cannot do without them. On the other hand, it cannot be good for the young or old, or persons of a delicate constitution, to go from a warm sitting-room to an icy bed—it causes wakefulness, if nothing worse. Probably the best, though a rather troublesome method, would still be to use the old-fashioned warming-pan; by this means the whole bed is thoroughly warmed, and no foot-warmer need be used. Electrical variations of the warming-pan can now be obtained. For little children, the cot may be warmed by a hot-water bottle, which is removed when they are put to bed.

CLOVE.—Cloves are obtained from the dried flower-buds of a species of myrtle grown in the Indian Archipelago. The oil or the infusion of cloves may be used internally in order to relieve the colicky pains in indigestion. Cotton-wool dipped in oil of cloves and applied to the hollow of a decayed tooth, or a clove chewed, is generally found to relieve toothache. Cloves are frequently used in cookery because of their aromatic flavour; they also impart a pleasant odour to the breath.

CLUB-FOOT.—Club-foot or talipes is a deformity in which the foot is twisted so that it is no longer able to be placed upon the ground. The condition may be congenital (present at birth) or it may occur later in life as a result of paralysis or injury.

There are four varieties of club-foot: (1) *talipes equinus*, in which the heel is raised from the ground, causing the patient to walk on the ball of the foot; (2) *talipes calcaneus* is the opposite condition, where the heel rests on the ground and the front of the foot is raised; (3) *talipes varus* is the condition in which the sole of the foot is turned inwards, so that the patient walks on the outer edge of the foot; and (4) in *talipes valgus* the foot is turned outwards, causing the patient to walk on the inside of his foot. These forms are usually combined, as in the condition of *talipes equina-varus*, where the heel is drawn up and the sole is turned inwards, or *talipes calcaneo-valgus*, where the heel rests on the ground and the sole is turned outwards.

Treatment.—For the cases acquired at birth, treatment must begin in the early weeks of life while the bones are still very soft and pliable. The position of the foot must be corrected several times daily, the mother or nurse gently but firmly turning the foot to the normal position and holding it there for a few minutes. In addition to this, the muscles of the legs should be massaged daily. A splint should be used to hold the foot more firmly in position, so that, as the child grows older, the bones will gradually assume a normal shape. If massage and manipulations are not carried out immediately after birth it may be necessary later on to resort to surgical operation. Tendons may have to be divided or parts of the deformed bones may have to be removed, especially in bad cases.

When the deformity is due to paralysis, treatment by massage and electricity may be found beneficial. For cases which are due to contraction of the muscles following an injury, operation may be necessary. In

most cases it will be found necessary to wear a special apparatus in order to support the ankle and keep it in the correct position. Treatment is generally a very prolonged affair, and in order to get the best results, must be carried out regularly and patiently.

COAL-MINER'S LUNG.—This is a condition which is common amongst coal-miners, in which the linings of the lungs become impregnated with particles of coal-dust. It is described under ANTHRACOSIS.

COCAINE.—Cocaine is obtained from the leaves of two South American plants. The dried coca leaves have been used from time immemorial by the natives, who roll them up with a little lime and chew them. Cocaine is largely used in medicine to relieve pain, and a few drops of it may be injected under the skin as a local anæsthetic when a very small operation has to be performed. Operations on the nose and mouth may be carried out after painting a solution of cocaine over the part. Cocaine ointment is useful when applied to the skin in cases of itching, eczema and shingles, but it must never be used in cases where the skin is broken. Small doses of cocaine have been given to allay excessive vomiting, and it has been said to cure sea-sickness. A solution is used to soothe pain in the eye due to the presence of a foreign body, or slight operations may be carried out while the eye is anæsthetized with cocaine. In moderate doses the bodily and mental powers are greatly increased for a short time, and under the influence of this drug travellers and hunters have been able to perform feats of strength and endurance far beyond the normal. A feeling of happiness and excitement is obtained, and all sense of bodily or mental fatigue is abolished. Unfortunately it is a drug which it is very dangerous to take, as a habit is quickly formed. The victim of the cocaine habit soon develops symptoms of acute indigestion, insomnia, emaciation and insanity, and an early death follows. It is almost unknown for a cocaine addict to be cured of the craving.

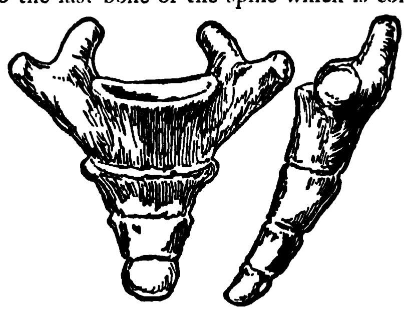
Poisoning by Cocaine.—A single large dose may cause extreme mental excitement, delirium and convulsions. Taken habitually in small doses, the patient eventually loses all moral sense, and becomes a victim of sleeplessness. Death may result from sudden paralysis of the central nervous system.

Treatment—In cases of acute poisoning, the stomach should be washed out by means of a stomach tube. The poisonous effects are best counteracted by giving ammonia, digitalis, strychnine, amyl nitrite, or nitro-glycerin, with strong coffee by mouth, or if the patient is unconscious, by injection into the rectum. Anæsthesia by chloroform and ether may be necessary to stop the convulsions. (*See also* ANÆSTHESIA.)

COCCUS.—A coccus is the name given to spherical-shaped germs. The name is derived from the Greek for a berry. The commonest cocci are streptococci, staphylococci and pneumococci, of which accounts are given in the article on GERMS.

COCCYDYNIA.—This is a condition where there is pain more or less severe in the region of the coccyx or end of the spine. Sitting, walking, and moving of the bowels may cause pain which is sometimes described as being excruciating. There may be a history of an injury to the coccyx caused by a blow or at childbirth, but sometimes the condition is a nervous one.

COCCYX.—The coccyx is the name given to the last bone of the spine which is com-



Coccyx

posed of four rudimentary vertebræ, and corresponds to the tail in animals. In early life the joint between the coccyx and the *sacrum* is movable but it becomes fixed in later life. It sometimes happens that the coccyx is slightly bent inwards and this may be the cause of backache. A coccyx that is too long may cause discomfort after sitting for a lengthy period. The coccyx may be damaged or displaced by sitting down suddenly on something hard. A displaced coccyx can be returned to position, but is apt to slip out again. In a few cases rigidity of the coccyx may cause difficulty in childbirth. (*See also* COCCYDYNIA; VERTEBRA.)

COD-LIVER OIL.—This is a very valuable and easily digested form of fat. Not only is it very easily absorbed into the blood by itself, but it seems also to aid the absorption of other foods. It is made by purifying the oil obtained from the livers of cod-fish. Scottish oils are said to contain the most vitamins, the oil obtained from Newfoundland ranking second, then the Norwegian. Owing to its richness in vitamins A and D, cod-liver oil is invaluable in the treatment of rickets, or in wasting diseases such as consumption or general debility. It may also be given to relieve the cough in chronic bronchitis, or to tone up the nervous system, and it is very useful for children who have been suffering from under-nourishment. It is often given in the treatment of some chronic skin diseases.

An emulsion is more easily taken than the pure oil, and doses should be very small at first—about one teaspoonful—gradually increasing the amount to about four or more teaspoonfuls. A mixture of cod-liver oil and malt extract may be found more palatable to the taste; it should be taken immediately after a meal or at bed-time. When it is impossible to get the patient to take the oil internally, it may be rubbed into the skin. A tablespoonful is well rubbed into the abdomen every night and a flannel binder applied. These inunctions may cause a disagreeable odour, but the results are generally so beneficial, especially in the case of an ill-nourished child, that it is well worth while to continue the practice. (*See also* FOOD; VITAMINS; SUPPLEMENT ON DIET AND INVALID COOKERY.)

COLCHICUM.—Various drug preparations are obtained from the root and seed of colchicum, or meadow saffron. It is a drug which is hardly ever used except for gout. Given during an attack it acts very rapidly and markedly relieves the pain. Colchicum wine is sometimes used. Those who take colchicum in any form should keep the bowels well open, otherwise it may accumulate in the body. It is a drug which should be used with great caution, as in larger doses it gives rise to great abdominal pain, vomiting, diarrhœa, and prostration and collapse.

COLD, THE COMMON.—The common cold, which is sometimes called by the technical names of *coryza* or acute nasal catarrh, is the commonest ailment that afflicts mankind, and no one seems to hit upon anything that will rid us of the plague.

Symptoms.—The symptoms of cold in the head are well-known to everyone. Sometimes an attack starts with shivering and chilly feelings down the back, sometimes with a sore throat and sometimes with headache and stuffiness in the nose. In whatever way the attack starts, however, there will soon be a "streaming" nose and perhaps watering eyes. The watery discharge from the nose may be cleared up in a couple of days, or it may progress to a thick yellowish discharge which will take up to a week to get rid of. Sometimes the discharge settles down to become a chronic catarrh of the nose which may be quite difficult to deal with.

Causes of "colds."—Cold in the head is an infectious disease caused by a variety of germs. The severity of the cold depends largely upon the degree of harmfulness of the germ and to the degree of susceptibility of the individual. Some people are much more liable to catch colds than others, and this is the reason that people with colds should treat themselves as infectious, as indeed they are, and keep out of crowded places, refrain from visiting sick or delicate persons and, if they must go about amongst their fellows whilst in the "streaming" stages, be careful to cover the mouth and nose with a handkerchief when sneezing or coughing. The cold that is slight in their case may be serious in their neighbours. A couple of days off from the office may not matter to them whereas to another it may spell disaster.

Treatment.—Many people have their pet ways of trying to prevent the catching of colds by taking precautions when they have been with a person who has a cold or when colds are epidemic. These certainly do good and may mean a slight cold instead of a severe one. Such methods are: spraying the rooms with disinfectant, burning disinfectant vapours, putting eucalyptus, Friar's balsam or some such preparation on the handkerchief; or on the other hand, spraying the nose and gargling. This routine of spraying and gargling does ward off many colds, but the day will inevitably come when the most careful person will fall a victim. A healthy mode of life and fresh air in the house without draughts are really the best preventives. The teeth, nose and throat should

be examined if the tendency to catch cold is very marked.

When the cold has actually been caught, and is in full swing, simple treatment will relieve the discomfort and the cold should run its course very quickly. If the person recognizes in time that a cold is coming on, he may cut short the attack by taking a hot bath and retiring to bed with hot drinks and something to cause perspiration. A couple of aspirin or similar tablets or a Dover's powder. If the symptoms have subsided by the morning begin taking a tonic, and be careful to avoid catching new infection or a chill for the next few days. If, however, the cold is well developed, follow the same treatment or use any of the favourite cold remedies such as ammoniated tincture of quinine, a few drops of camphor on a lump of sugar, or two aspirins every four hours (if in bed or confined to the house only). If the throat is sore, gargle at intervals with salt and warm water or some simple gargle such as glycerine of thymol. For the sore nose and nasal discharge, inhalations are of the greatest assistance. Menthol crystals, Friar's balsam, or oil of eucalyptus may be used by the method of pouring boiling water over the crystals or liquid in a bowl and holding the head over the bowl, while breathing in the scented steam. A large towel placed over the head and bowl forms a tent to keep the steam from escaping. Soothing substances such as chloretone inhalant may be sprayed in vapour form into the back of the nose with pleasant effects, by a special spray called an atomizer. Or an ordinary liquid spray may be used with glycerine of thymol or some such substance. Blackcurrant jujubes are a favourite thing to suck during a cold if the throat is at all irritable.

When the cold is over, tone up the general health with a tonic and remember that colds *are* infectious. (*See also* INFLUENZA.)

COLD CREAM.—This is a soothing emollient which may be used for irritated or inflamed skins. It can be made with white beeswax, almond oil, borax and rose-water; but there are so many good and safe cold creams to be had that it is much easier to buy the article from the chemist. (*See also* SUPPLEMENT ON BEAUTY CULTURE.)

COLD PACK.—When a patient's temperature is abnormally high, such as often occurs in fevers, etc., it may be lowered by means of a cold pack, which is carried out as follows:

A mackintosh sheet is rolled under the patient as well as an ordinary sheet for him to lie on; the patient should be stripped and covered over with a sheet or blanket. A number of towels are then wrung out in very cold water and wrapped around the patient, using one or two towels to each limb, one over the chest and abdomen and one under the back. The patient is then tucked in with a sheet or blanket and left until the towels become warm. The cold wet towels should be renewed if necessary about every hour. The patient's temperature must be taken periodically and hot blankets and hot-water bottles should be kept in readiness in case of shock. When taking the patient out of the pack, the wet towels should be removed and the whole body gently dried. The patient should be dressed and covered with blankets and left to rest. Cold packs should only be given when ordered by the doctor. Cold sponging at intervals is not such a drastic treatment for lowering the temperature.

COLIC.—Colic is the term used to denote pain due to irregular or violent contractions of muscular tissues in the body. The most usual form is that due to spasmodic contractions of the bowel and is called *intestinal colic.* There may be *gastric colic* in the stomach, *biliary colic* due to irregular contractions of the bile ducts, *renal colic* in the kidneys, etc. The cause of colic is usually some kind of irritation such as indigestible food in the stomach or a stone obstructing a duct. The muscular walls of the ducts try to pass on the stone by their contractions and pain results. When muscular tissue is fulfilling its ordinary function without opposition from irritating substances there is no pain.

Treatment.—Colic may be so severe that morphia will have to be administered, as in the case of biliary colic. Atropine is the most useful drug for counteracting the tendency of muscles to go into spasms. The most common form of colic is intestinal colic due to constipation, undigested food or to a chill. Sips of hot water with peppermint or ginger in it or a dose of chlorodyne may relieve the pain, but castor-oil should be taken afterwards to remove the cause of the irritation. Frequently a hot-water bottle held to the part will be all the treatment necessary to relieve the pain temporarily.

If colic does not yield to simple remedies quickly, it is always best to call in a doctor, as it is impossible for the ordinary person to be sure of the cause of the pain.

The commonest cause of colic in babies is cold, and this should be remedied by giving sips of warm water and applying heat to the abdomen, taking great care, however, that the fomentation or hot-water bottle is not too hot for the delicate skin of the infant. Children whose extremities are exposed in cold weather are apt to suffer from colic. The blood circulating in the head and feet is more exposed to extremes of temperature than that in the big vessels of the trunk and therefore should be protected in cold weather by caps and socks.

COLITIS.—By colitis is meant inflammation of the large bowel or intestine. The condition is described according to its nature as mucous colitis, catarrhal colitis and ulcerative colitis.

Mucous Colitis.—The distinguishing feature of this condition is the passage from the bowel of quantities of membraneous-looking material which consists entirely of mucus. Mucus is the slimy material which exudes from the mucous membranes or linings of the various organs or passages of the body. In the case of mucous colitis the mucus is from the lining of the large intestine, and it may be due to a catarrhal condition of the bowel or to a nervous condition in which too large a quantity of mucus is being given off.

Symptoms.—The mucus passed in mucous colitis is very varied in character. It is sometimes passed in long bands of a ribbon-like appearance, which may be mistaken for segments of a tape-worm. It may be of considerable thickness and bear on its surface the marks of the folds of the intestine, or it may be in the shape of a tube surrounding portions of the stool, so that people are led to believe that they have passed pieces of the bowel itself. It occurs most commonly in females. Before the disease becomes fully established there is generally a history of poor health dating from an attack of some illness such as influenza. Patients who subsequently develop mucous colitis have often been subject to occasional attacks of cramp in the bowels, usually lasting a day or two, dyspepsia, flatulence, etc. The main symptom is that of constipation of a very severe nature requiring the constant employment of purgatives to overcome it. The motions are generally hard masses often covered with glairy mucus. At other times the motions are ribbon-shaped or have a pipe-stem character, indicating spasm of the intestine.

The constipation may be replaced by a continuous diarrhœa with frequent loose motions containing much mucus and a quantity of thin watery material. There is some dull aching pain and a feeling of discomfort and uneasiness along the whole course of the large intestine. There may be attacks of severe pain, lasting several hours, followed by the passage of quantities of tough and stringy mucus. The pain is caused by the efforts of the bowel to rid itself of the tenacious mucus which clings to it. The severity of the pain may cause vomiting, and a constant desire to pass a motion. The abdominal wall is always flabby. The tongue is pale and flabby and coated with a white fur; the breath is often offensive and the appetite very capricious. The patient often complains of flatulence and other signs of gastric dyspepsia. Most of the sufferers of this complaint are thin, anæmic, pale and poorly nourished, always complaining of feeling cold and of pain in the back and in the loins. They are often very neurotic and take a morbid interest in their symptoms. It is generally associated with an excess of uric acid in the urine.

The disease is rarely fatal, but is apt to last a long time, and be very difficult to cure. A large number of sufferers from it become chronic invalids.

Treatment must aim at three things: overcoming the tendency to constipation; improving the patient's nutrition; stimulating and strengthening the nervous system.

The patient should be confined to bed at first in severe cases for at least six weeks, if possible among strange surroundings. Visits from friends and relations should be forbidden, but the surroundings must be cheerful. The diet must be ample and nutritious, well cooked and daintily served, consisting chiefly of eggs, raw or lightly boiled; soups, meat jellies, custards, finely-minced beef and mutton, calves'-feet jelly, fish souffles, pounded chicken, crisp toast or biscuits with plenty of butter. The patient must avoid green vegetables, starchy foods, fruits, pastry and cheese.

The bowels must be made to open

regularly every morning, and this can be done by suitable doses of castor-oil continued without intermission for several months. It must be given in doses sufficient to produce a soft motion, and the quantity will naturally vary in different individuals. Where castor-oil is too unpalatable, sulphur and cream of tartar, half a dram of each mixed with a little syrup of lemon, can be substituted. Liquid paraffin is sometimes very useful. Irrigation of the bowel is often useful as it washes away the tenacious mucus which clings to the walls of the intestines. Plombières treatment is also useful if it can be obtained. (*See also* IRRIGATION OF THE BOWEL; PLOMBIÈRES TREATMENT.)

Convalescence.—If possible, when the patient begins to improve, a long holiday should be taken in order that the patient's thoughts and attentions be turned away from his own ailment and occupied with change of scene. A place with a mild climate should be chosen.

Acute Catarrhal Colitis.—Acute attacks of inflammation of the bowel are usually due to the eating of some doubtful article of food or something else which "disagrees" and are part of a general stomach and intestinal upset.

Symptoms.—The symptoms are well known. Colicky pain in the lower or middle part of the abdomen, sickness and diarrhœa; fluid and offensive motions which may contain an excess of mucus. The temperature may rise and there may be skin rashes, such as urticaria or nettle-rash.

Treatment.—Put the patient to bed and give no food, but plenty of plain water, which must be boiled, should be drunk. In order to keep up the patient's strength thin liquids like chicken broth, whey or albumen water may be given, and small doses of brandy at intervals if the prostration is very bad. Give a good purge of castor-oil. If the patient is a baby give ½ to 1 teaspoonful and for an older person from a teaspoonful for a small child up to two tablespoonsful for an adult. As soon as the diarrhœa has ceased, bring the patient gradually back to normal diet, restricting the diet again immediately if there is any sign of a return of the diarrhœa. Usually, cases due to contaminated food clear up entirely in a few days, but sometimes the colitis becomes chronic and may drag on for months. It is as well, therefore, to treat the matter with care at the beginning in order to avoid such a complication.

Ulcerative Colitis.—Colitis in which the bowel ulcerates is a not uncommon disease of middle life; it is very difficult to cure and is of serious import. It is not known what causes it, but as it closely resembles tropical dysentery it may be due to some similar germ. It begins gradually with increasing diarrhœa in which mucus, pus and blood are passed. The number of stools increases to as many as twenty a day. The patient soon becomes desperately ill and wastes away, often dying of exhaustion if the disease cannot be stopped in time.

Treatment.—The treatment is the same as for mucous colitis, but when the patient recovers he must always be careful what food he eats, and must confine himself to food which leaves little residue in the bowel, such as milky foods, fish and chicken. Meat, vegetables and fruit are better entirely avoided. Constipation must also be guarded against by taking some intestinal lubricant such as liquid paraffin. (*See also* DIARRHŒA; DYSENTERY; ENTERITIS.)

COLLAPSE.—This term is applied to a condition of extreme exhaustion. It may follow some prostrating disease such as pneumonia, cholera, infantile diarrhœa, etc. Any condition in which there is a great loss of fluids from the blood-vessels may bring about a state of collapse. The state of collapse is very similar to the condition of surgical shock. The main difference between the two lies in the onset, which is more gradual when the state is due to some disease.

Symptoms.—The face is pale and haggard and the eyes are sunken and glassy. The body may be covered with cold sweat, while the temperature is generally reduced to 95°–97° F. The voice is very weak, and the pulse feeble. The patient may be quite conscious but unable to pay attention to what is going on around him, while in other cases unconsciousness may occur.

Treatment consists of keeping the patient as warm as possible. He should be allowed to lie on his back with his head low, and medical advice should be sought. Hot-water bottles should be placed at the feet and sides and warm blankets should be used to cover him Stimulants should only be

administered under medical supervision in cases suffering from collapse resulting from bleeding, or when bleeding is likely to occur.

COLLAR-BONE.—The medical name for the collar-bone is the clavicle, and it is described under that title.

COLLES' FRACTURE.—Colles' fracture is a break in the radius at the lower end just above the wrist. This type of fracture is usually caused by a fall on the hand when the arm is outstretched to save oneself, and the end of the bone may be impacted, or driven on to the upper part. Colles' fractures usually unite without leaving much deformity of the arm, and the arm is fit for use in three or four weeks.

COLLODION.—This is a thick liquid made by dissolving gun-cotton in ether and alcohol, or with acetone. When painted on the skin the ether rapidly dries, leaving a thin protective film. This forms an excellent covering for small wounds after they have been thoroughly cleansed and dried, but it must not be used on discharging wounds. Collodium callosum, which is collodion used in conjunction with salicylic acid, is a rapid and painless solvent for corns and warts.

COLLOID.—This is a name applied to a type of cancer in which the tumour is filled with a glue-like substance. It affects chiefly the internal organs.

COLLYRIUM.—A lotion for the eyes is called a collyrium, and the one most commonly used is a solution of boracic acid.

COLOCYNTH.—Colocynth, or bitter apple, is obtained from the dried pulp or pith of the fruit of a species of cucumber, which is imported from Smyrna and Spain. It is a powerful purgative and should be used with discretion.

COLOMBA.—Fissures or cracks in any part of the eye are called *Colomba.*

COLON.—The large bowel or large intestine is called the colon. It is described under the heading INTESTINE.

COLOUR-BLINDNESS.—Some people are unable to distinguish between colours, and are called *colour-blind.* The degree of colour-blindness varies, the commonest form being the inability to distinguish between red and green; blue-yellow colour-blindness is much more uncommon, and total colour-blindness very rare. The condition is very much more common in men than in women, and occurs equally in all races. It is apt to run in families, several brothers, perhaps, being affected; or it is sometimes transmitted from grandfather to grandson, the son escaping the defect. Colour-blindness may exist in one eye only, the other having normal colour-vision. The acuteness of vision is unaffected in any way, and, as a rule, the "patient" feels no inconvenience. It is usually a friend or relative who discovers the condition. He may even name the colours of things correctly, because he has been told that a geranium is scarlet, or that the grass is green; but he sees only a difference in shade, not in colour. In tests among a large number of people, both men and women, it was found that 6 per cent. of men were wholly colour-blind, 25 per cent. were partially colour-blind, and 11 per cent. of women were partially colour-blind.

It is found to be commonest among musicians, and it is suggested that in these cases the hearing has been developed at the expense of the sight. It is a curious fact, though, that as a class, colour-blind persons are above the average in intelligence; it is, indeed, frequently associated with very high ability, many of the greatest men having suffered from this defect. Such was John Dalton, the famous chemist, who, having discovered it in himself, set to work to study it, and in 1794 published the first scientific account of colour-blindness. Seebeck, who continued his investigations, in 1836 published a further account. George Wilson of Edinburgh (1818–1859), was the first to advocate attention to the practical side of the question. He died, however, before his work had received the recognition it deserved, and it was not until 1877 that Holmgren succeeded in making it plain that colour-blindness was of social importance. Since that time various tests for colour-blindness have been instituted in some professions. A most interesting account of a railway accident due to the engine-driver being colour-blind, is given in Mrs. Henry Wood's novel "The Red Court Farm." This was, of course, before the tests were instituted. Nowadays, and quite rightly, candidates for the Navy, the Air Service, the British Mercantile Marine, and the Railway Service must have perfect colour-vision before they are accepted. "The lives of hundreds may at any moment depend on the colour perception of one or two men."

In the Army, colour-blindness does not necessarily involve rejection.

The methods of testing for colour-blindness for practical purposes must show that the candidate can distinguish between colours used in his employment. Formerly, and still to some extent, "Holmgren's wools" were used. The candidate was given a certain coloured skein of wool, which was, of course, not *named* by the examiner, and asked to pick out, from a large number of mixed skeins, the other skeins of the same colour, whether lighter or darker in shade. It was possible to find, by this method, whether a person was colour-blind, and to what colours. It was not, however, very accurate, and naturally produced considerable dissatisfaction among men who were rejected by what they considered to be an unfair test.

Edridge-Green, a modern investigator, does not consider the "wool" test to be nearly accurate enough for practical purposes. He has therefore devised a lantern, by means of which coloured lights are shown to the candidate, who must *name* them correctly. The naming of colours was not included in the wool test; but as Edridge-Green says, perfectly justly, the engine-driver (to take an instance) must *name* the colour of a signal-lamp to himself before he can decide what is his duty. Not only are the clear lights shewn, but these are modified to imitate their appearance in different weathers, haze, fog, heavy rain, and so on. By this excellent test; it is clearly seen whether the candidate is fit or unfit to have charge of a ship, an engine, and so on. In the Board of Trade examinations for the sea and the railway, such a lantern is now used.

Acquired colour-blindness occurs in disease of the light-perceiving apparatus, i.e. the retina, the optic nerve, and the sight centres in the brain. It differs from the congenital or natural form in that there is an associated failure of acuteness of vision. It generally occurs in a definite order: first the green fails, then the red, and lastly the blue. This is well seen in tobacco blindness, of which a full description is given under BLINDNESS.

It is easy to see that acquired colour-blindness may be a source of a great danger to sea-captains, engine-drivers, and so on, and they are re-tested from time to time to make sure that their colour-vision remains perfect.

COMA.—Coma is a state of deep unconsciousness. It is usually a matter of serious importance. Poisoning by various poisons which take effect on the nervous system, such as alcohol, prussic acid, opium and any of the sleep-inducing drugs such as those derived from barbituric acid (like veronal), cause coma. Certain injuries to the brain which cause pressure on the brain, such as fracture of the skull or brain tumour, may bring on coma. There may be coma in very severe attacks of influenza, malaria, sleeping-sickness and even measles. Coma is also a symptom of severe diabetes. Coma vigil is the name given to a state which occurs with severe fevers in which the patient lies muttering to himself often with his eyes open but is really in a state of unconsciousness.

Treatment.—When a person is found lying unconscious without any obvious cause and cannot be wakened, a doctor should always be sent for, even if it is suspected that the cause is really heavy drinking, because it may be a state of coma due to some disease or poison which is threatening the patient's life. The coma of diabetes can now be dispersed almost immediately by an injection of insulin. (*See also* DIABETES.)

COMFORTER.—A comforter or dummy teat is used by many mothers to soothe a crying and irritable infant, but the disadvantages attached to this method of pacifying the child are so numerous as to heavily outweigh the advantages The continuous sucking movement which is necessary to hold the dummy in the mouth, is decidedly bad, and may eventually lead to deformity of the mouth and jaw and narrowing of the passages of the nose. Apart from this, the comforter is such a common method of transferring infectious germs to the child that it cannot be looked upon except as a continual source of danger. It may be taken for granted that the dummy falls from the baby's mouth dozens of times during the day, and there is no doubt that it is generally put back again into the mouth without being sterilized or even washed. When considering these disadvantages, a mother must realize that the use of a comforter will not add to the health of her child.

COMPLEXION.—*See* CARE OF THE COMPLEXION in BEAUTY CULTURE SUPPLEMENT.

COMPRESS.—A compress is a folded cloth, wet or dry, applied firmly to a part of the body for relief of inflammation, or to prevent hæmorrhage. A compress wrung out in ice-cold water is a very good way of treating a sprain or for the prevention of "black" eye.

COMPRESSION.—Compression of the brain is due to a piece of bone or a clot of blood pressing on the brain. In some cases a tumour, or inflammation of the outer coverings of the brain, may be causing the compression. It is a much more serious condition than that of concussion, and the treatment of the case will depend on the exciting cause. (*See also* BRAIN.)

CONCEPTION.—Conception means to become pregnant. (*See also* PREGNANCY.)

CONCUSSION.—Concussion of the brain is almost always caused by a fall or a blow. If the concussion is slight, the patient may be able to understand what is being said to him, but in more severe cases the patient may relapse into a state of unconsciousness.

Treatment.—The patient should be laid on his back and all clothing should be loosened, and plenty of fresh air is necessary. The patient must be kept perfectly quiet until the arrival of the doctor, and no attempts should be made to arouse him. (*See also* BRAIN.)

CONDENSED MILK.—This is cow's milk from which most of the watery elements have been evaporated. Condensed milk prepared with the addition of cane-sugar is a white, or rather yellowish-white, product of about the same thickness as honey. Condensed milk prepared without the addition of sugar is not boiled down to the same degree, and therefore remains more liquid. Children should not be fed wholly on condensed milk as it is deficient in vitamins and may lead to the development of scurvy. Dried milk may be had which contains the necessary vitamins, but orange juice should be added to the diet in order to eliminate any risk of scurvy. (*See also* SUPPLEMENT ON DIET AND INVALID COOKERY.)

CONDYLE.—By condyle is meant any rounded eminence such as occurs in the joints of many of the bones, especially the jutting-out pieces at the outer and inner sides of the elbow or the knee.

CONDYLOMA.—A wart-like growth or tumour often found near the opening of the anus. Growths of this type can be removed by the use of caustics or by surgery.

CONDY'S FLUID.—A powerful disinfectant named after an English physician, Henry Bollmann Condy, who lived in the 19th century. One part of sodium or potassium permanganate dissolved in 500 parts of water will make an efficient disinfectant.

CONFECTION.—This term is used by druggists to indicate a preparation of sugar or honey which is mixed with drugs into paste.

CONFINEMENT.—This term is used in connection with childbirth, usually to denote the lying-in period. (*See also* CHILDBIRTH; LABOUR; PUERPERIUM.)

CONGENITAL.—This term is used in connection with any disease or condition which is present at birth. Many congenital deformities of the body are due to accidents before or during birth. Conditions, such as congenital dislocation of the hip, may not be noticed until the child starts to walk. Some congenital deformities of the hands and feet include club hand; polydactylism, that is, the presence of extra fingers or toes; overgrowth of one or more fingers or toes; and club-foot. Syphilis is one of the most common congenital diseases.

CONGESTION.—When any abnormal amount of blood collects in any organ or part of the body, causing swelling of the part, it is said to be congested. The condition may be due to some weakness of the circulation, but often it is an early symptom of inflammation. It becomes a serious condition when the lungs are affected. The term congestion is applied to the various parts of the body that are affected, such as the brain, lungs or kidneys. The active, acute form of congestion is one which is due to inflammation, and the passive, chronic form is one in which the blood-vessels become overfilled because of some weakness of the circulation. In certain diseases congestion is artificially carried out as a method of treatment. The actual treatment of congestion depends so much on the part affected that no definite rules can be given here. For congestion of the brain *see* MENINGITIS. Lungs and kidneys, etc., will be found under their own headings.

CONJUNCTIVA.—The conjunctiva is the thin membrane lining the eyelids and covering the white of the eye. It continually "sweeps" the eye by the involuntary closure of the lids, and keeps it moist and free from friction by mucus poured out by its glands on to the surface. It is well supplied with blood-vessels, and this character, together with its constant exposure to the air, render it very liable to attacks of inflammation, which is called conjunctivitis.

CONJUNCTIVITIS is caused by anything that irritates the conjunctiva; there are many forms. The three chief symptoms of conjunctivitis are pain, running of the eyes, and congestion of the blood-vessels. The pain is generally described as smarting, scalding, or itching. The secretion of the eye may be only slightly increased, so that the eye feels sticky, and the eyelids and eyelashes are "gummed" together in the mornings; or there may be a copious running of a watery or thick pus. The tiny vessels usually seen in the white of the eye are enlarged and scarlet.

These signs vary a good deal in different patients and in different types of the disease, and because a patient's symptoms may appear to be chronic or mild, it does not necessarily follow that the eyes are less harmed than in the acute forms of conjunctivitis. *No eye trouble, however slight it may seem to be, should in any circumstances be treated as of no account.*

Treatment.—In treatment, the *cause* as far as possible must be corrected. The eyes should be rested and protected from any irritants such as smoke, bright lights or cold winds. Warm antiseptic washes are used several times daily; these serve both to wash away the secretion and germs, if present, and are also very soothing to the inflamed eyes. Special symptoms, such as pain or twitching of the eyelids, are relieved by cocaine locally, or a chloral and bromide mixture. A soothing ointment is applied to the edges of the lids.

Every case should be treated as if infectious; it is impossible to be too careful. Any dressings should at once be burnt. The patient should never be allowed, as sometimes happens, to use the same towel over and over again to wipe away the discharge; and, of course, no other person, especially a child, should be allowed access to towels, etc., used by the patient. These details may seem unnecessarily troublesome; but, if carefully attended to, a great deal of eye trouble would be avoided.

The general health is often at fault and should be carefully regulated. Treatment with laxatives and tonics often helps greatly. The food should be good, nourishing and plain, and plenty of time allowed for sleep. A daily warm bath is helpful in increasing the action of the skin. The patient should be in the fresh air as much as possible, provided that the eyes are protected from sun, wind and dust.

Simple Conjunctivitis is caused by any persistent irritation, such as a dusty or fume-laden air, eye-strain, working in a too brilliant light, the misuse of alcohol, etc.

Treatment.—The treatment is according to the cause, which should be removed, and the eyes should be frequently bathed with a mild alkaline lotion, such as weak bicarbonate of soda in warm water.

Angular Conjunctivitis is a very chronic form of conjunctivitis in which the reddening of the eyes is especially noticeable in the corners. It is treated by zinc drops or ointment.

Catarrhal Conjunctivitis or Pink Eye is very contagious, and the disease may attack several members of a family, or run through a school. In addition to the usual symptoms, a dislike of light is present, and adults generally suffer a good deal of pain.

Treatment.—The disease is easy to treat, as it usually recovers of its own accord in a week or two. Frequent washing with an antiseptic lotion and the use of an antiseptic ointment are all that is necessary.

Diphtheritic and Membranous Conjunctivitis.—This class includes all cases of conjunctivitis in which the chief symptom is the formation of a membrane upon the conjunctiva. It occurs only in childhood. The child is acutely ill, and the inner surface of the eyelids is found to be covered with a greyish, tough membrane. When removed, it leaves a bleeding surface. In bad cases blindness may occur.

Treatment.—All doubtful cases are treated as diphtheritic, and antitoxin is given. The affected eye is kept as clean as possible, the membrane being frequently removed. The general condition must receive careful attention.

Follicular Conjunctivitis has at first sight

a great resemblance to trachoma. The likeness is, however, more apparent than real. This form is found to occur only in children of a poor type, and is due to uncleanliness and bad hygiene. Adenoids are often present.

Treatment.—If the case is severe, the "sago-grain bodies" may be removed, but in most cases astringent lotions cure successfully. The general hygiene should be looked to, and tonics are useful.

Granular Conjunctivitis or Trachoma is a very chronic form, in which small nodules, aptly described as "sago-grain bodies," form under the conjunctiva. The persistent irritation from these gives rise to a chronic conjunctivitis. As the disease progresses the inflammation gradually dies down, but the mucous membrane of the eyelids is destroyed, so that the eye is ill-nourished and sight may be affected. The scar tissue in the eyelids contracts and causes the eyelids, with the eyelashes, to turn inwards. This gives rise not only to great discomfort but to considerable injury to the eye itself.

Treatment.—Treatment varies according to the stages of the disease. If the condition is acute, it is treated as purulent conjunctivitis. When the "sago-grains" have formed, they are mechanically removed. When trachoma has reached the stage of overgrowth, an astringent application such as copper sulphate lotion is used. This treatment requires a great deal of patience, as it may take months or years to attain a good result. In "healed" cases, where a scar membrane replaces the conjunctiva, the best application is diluted glycerine drops.

Purulent Conjunctivitis is one of the most dangerous forms. It is most common in infants and young adults. In the great majority of cases it is due to gonorrhœal infection. When it occurs in infancy, it is generally known as *Ophthalmia neonatorum*. (*See* BLINDNESS.) In most cases the infection is conveyed to the infant's eyes at birth from the passages of the mother. On about the third day, the baby's eyes are seen to be reddened, and a watery discharge is flowing from them. By the next day the condition is much worse. The eyelids are much swollen, purple-red and glazed. The discharge is now very copious, and consists of thick yellow matter.

Treatment.—Unless treatment is very prompt and effective, the result of ophthalmia neonatorum is some permanent damage to the sight, or even total blindness. Fortunately, there is a simple method of prevention, which consists in disinfection of the infant's eyes immediately after birth with a solution of silver nitrate. *This should be done as a routine measure in all cases, whether "suspicious" or not.* If ophthalmia neonatorum occurs, the most important and difficult part of the treatment is to keep the eye free from pus. If possible, the child should be admitted to hospital with its mother, not only because it can then be fed naturally, but so that both mother and child can be treated. The baby's eyes are washed out every hour or even half-hour, as the discharge produced is extremely copious. Great care is taken in opening the eyes, as the highly-infectious pus is generally under pressure, and spurts out to some distance when the eyelids are raised. All dressings should be burnt immediately, and towels, clothes, etc., treated with disinfectant before being washed.

In adults, cases of purulent conjunctivitis are even more dangerous to sight. The patients are generally young men. The symptoms are very similar to those found in the infant, except that they are more severe and the general health is much disturbed. The eyelids are much discoloured and very swollen.

Treatment.—The treatment is as before with a few modifications. In adult cases it is not uncommon to find only one eye affected, and every effort should be made to protect the "good" eye, both by means of antiseptics and by covering it. The patient is told to sleep on the diseased side, so that no pus shall trickle over into the other eye. It takes 4–6 weeks for the cure to be complete, and, even with the greatest care, there is in many cases some damage to sight.

Pustular Conjunctivitis occurs almost always in tubercular children between 7 and 15. The child frequently has also enlarged or discharging glands in the neck, and the usual signs of conjunctivitis are seen together with abscesses on the eyeball.

Treatment.—This form of conjunctivitis is treated by mercury, in the form of "golden ointment." Tinted glasses may be worn if there is much pain in the light. It is, however, of great importance that the general health be looked to in this condition.

CONSTIPATION OR COSTIVENESS is the very common condition in which the bowels do not move often enough or are not completely emptied when they do move. The number of motions required for health varies for different people. The majority of people have the bowels opened once a day; but two motions a day are quite usual, and some other people have only a motion every other day without apparently feeling any bad effects. Constipation may be temporary and due to some passing illness or lack of tone; but in many people it tends to be chronic, and some means of correcting it has to be carried out continuously or a state of health continually below par, will arise. The stool of a normal healthy person is light brown in colour, 4 to 5 inches in length and about an inch thick, and should be passed in not more than two or three pieces. It should be light enough in weight to float in water. There are great differences, however, in the colour and amount of the stools of perfectly healthy people, due to what they eat and drink. Probably too much attention is being paid nowadays to the working of the bowels, and most people can miss an occasional day without any harm being done except the harm that comes to them from worrying unnecessarily about themselves and purging themselves with an aperient, when, if things were left to themselves, the function would be restored of its own accord the next day. It is thought by some authorities that there is very little absorption of poisonous materials or toxins from the bowel into the blood-stream if the contents of the intestines are solid, and that unhealthy absorption of toxins takes place much more easily from fluid contents of the bowel. The action of aperients on the bowel is to hasten the contents of the stomach into the bowel in a liquid state. It seems therefore sensible to think that as long as there is no disease in the stomach or intestine a slight degree of constipation is preferable to making the contents of the bowel fluid by aperients. Any state of ill-health in the alimentary tract will, however, be made worse by constipation, so where definite symptoms are caused the constipation should be treated.

Symptoms.—The symptoms that can be caused by constipation are numerous. The complexion becomes sallow and "muddy," the tongue is furred and the breath may be offensive. The appetite will not be good. There may be sick-headache, giddiness, mental depression and sleeplessness. In fact, almost any symptom of ill-health may be present in a mild form. As a general rule pain is not present with constipation unless aperients have been taken, when the pain is due to the contractions of the bowel which they cause. If there is great distension of the abdomen with gas, it means that there are harmful germs at work, and the condition will need treatment. Any sudden or violent pain, especially with sickness and collapse or a rise in temperature, should be attended to at once by a doctor, as it may mean ulceration or obstruction in the bowel. Pain at the actual moment of passing the motion may be due to piles.

Treatment.—The treatment of chronic constipation where there is no definite disease causing it, is the treatment of the general state of health and the regulation of the diet and daily habits. The most important thing will probably be the daily exercise. A certain amount of exercise is absolutely necessary for everyone who does not obtain sufficient muscular exertion in the course of his day's work, and in this respect it may be remarked that housework in a small house, except on days when washing or strenuous cleaning is done, does not amount to sufficient exercise for many women. They need a brisk walk as well. The object of the exercise is to stimulate the working of the liver so that it will produce and send into the intestine enough bile to secure proper digestion of the food. It goes without saying that the call to the stool should be answered as soon as it occurs. In most persons' lives it is convenient to so train the bowel that the call comes at the same time every day, and it should be at a time that is likely to be a convenient one. This training can be begun in the very earliest days of babyhood.

The question of diet is, of course, of the greatest importance in the treatment of constipation. As a general rule it will be found that the diet of the constipated person is too solid, too concentrated and too easily digested. A certain amount of irritating matter or roughage is required to force the bowel to make the effort to get rid of it. This roughage is best obtained from porridge, brown bread, green vegetables, and certain

fruits like brambles, figs, or prunes which are not entirely digested. After roughage, fluid is necessary. This may be taken with the meals or in larger quantities between meals. Very few people living in towns drink a large enough quantity of fluid in the day. Some people may need more fat in the diet, and this is obtained by taking butter, cream, salad oil.

If attention to the diet, exercise and daily hygiene do not cure the constipation, it will then be necessary to use some simple aperient. These are fully discussed in a special article on aperients.

CONSTITUTION.—It is usual to speak of people as being of different constitutions, meaning just the general condition of their bodies especially with regard to the way they resist various diseases. It is well known that certain people are more liable than others to some forms of disease. The disease is said to "run in the family," or in medical terms they have a "diathesis" for that disease. Gout, rheumatism, diabetes, and tuberculosis or consumption are examples of diseases which are supposed to run in families and which some people are constitutionally more liable to contract than others. A "sound constitution" is probably the very best thing that a child can inherit from its parents; a body in which every organ is sound in structure and in perfect working order, the nervous system is steady and reliable and what may be called the "plumbing" of the body, the complicated system of piping and pumping which carries on the circulation of the blood, is in good trim.

Although certain sorts of constitutions are inherited, that does not mean that the disease to which the person will be constitutionally liable must inevitably overtake him. On the contrary, by knowing that he is liable to contract the disease he is enabled to take precautions, and if he can live in suitable surroundings and avoid things which would undermine his constitution, he need not fear that illness will overtake him. For example the children of consumptive parents, if placed in surroundings where they can get lots of fresh air and good plain food, as for instance in the country instead of in the town, will be no more likely to grow up consumptive than any other children; but if they continue the faults of living which led to the illness of the parents, notably living in houses of which the windows are never opened, they will take the disease, while their neighbours who have no constitutional tendency will go free.

A doctor when he first examines a patient will ask questions all about his family and parents and what they died of and at what ages, etc. Even the doings of aunts and uncles and remote cousins seem to interest him. This is because he is trying to gain some idea of what the constitution of his new patient is likely to be, and this knowledge once gained will be of the greatest importance in his treatment of the patient as the years go on, because an inherited tendency towards some disease may be absolutely overcome by leading a careful and regular life.

CONSUMPTION.—Consumption is the old name for the disease which is now called tuberculosis. Consumption of the lungs is called phthisis; consumption of the skin is called lupus. All forms of consumption except LUPUS are discussed under the heading TUBERCULOSIS.

CONTAGION.—The word contagion means the process by which certain diseases are communicated from one person to another. This may be done by direct contact with the patient who is harbouring infectious germs or by handling the clothes of such a patient. Syphilitic sores and other skin diseases are very common examples of contagious complaints, as they are readily communicated to anyone who comes in direct contact with them. The term infectious is generally used when the disease is communicated to another in a more indirect way. For example, infection may be spread through the air or by means of water or food; but on the whole, the border line between the two terms is a very narrow one.

CONTRACEPTION.—This term is derived from two words: contra, against, and conception, to conceive. It is applied to the prevention of conception, or birth control. (*See also* SEX HYGIENE.)

CONTRACTED FINGERS.—The condition in which the fingers become contracted is known as Dupuytren's contracture, after a famous French surgeon who died nearly a hundred years ago. It is often hereditary and is found in succeeding generations of

the same family, usually amongst the males. The skin and tissues beneath it in the ring and little fingers of one or both hands, become thickened and drawn together, so that the fingers become folded over into the palm of the hand. It is not known why the condition arises, but cases are found in gouty and rheumatic people and in people who use their hands a great deal as well as in cases where there does not appear to be any reason for the condition. It is thought by some authorities that a glandular deficiency may cause it and some cases have done very well on treatment by extract of thyroid gland.

Treatment.—In early cases massage may give relief and even stop the condition from getting worse, but when the fingers become really deformed the tissues beneath the skin may have to be operated on, and in the case of a manual worker it may be advantageous to remove the little finger entirely. (*See also* FINGER.)

CONTRACTURE.—Contracture means the permanent shortening, distortion or deformity of a muscle, or of various muscles, such as Dupuytren's contracture. Contraction is the term used for certain forms of temporary shortening.

CONTUSION.—A bruise is medically termed a contusion. This term generally means that the skin is unbroken but that swelling and discoloration are present. When the skin is broken it is referred to as a contused wound.

CONVALESCENCE.—When one refers to the convalescent period, it is generally implied that the patient is no longer on the danger list, but although the worst part of an acute disease may be over, the patient is still far from his normal healthy self. The convalescent period is a very important one, and it is at this time that good nursing plays a prominent part. If the patient has become very debilitated, convalescence may be a prolonged affair. In the case of children and young people, this period generally produces a feeling of restlessness, but a mother should take care that the patient is not allowed to over-tax the strength, as far-reaching complications are often set up through mere carelessness. The building up of the wasted tissues should be a gradual affair carried out by means of nourishing food and plenty of fresh air.

The Surroundings.—The room in which the patient lies should be as bright and airy as possible and, if it can be arranged, the colour scheme should harmonize with the patient's particular taste. The bed must not be placed in the way of a draught, or in such a position as to allow the sun to stream on to the patient's face. If convalescence takes place in winter a small cheerful fire should be kept going, but the chimney must not be allowed to smoke. The room should not be allowed to become over-heated, but this can be avoided by keeping the windows open whenever possible. Visitors should not be allowed to stay more than a few minutes at first, gradually increasing the stay and number of visitors as the patient becomes stronger. It is difficult for a normal healthy person to realize how tiring it is for an invalid to talk and appear cheerful when the strength is very much below par, and it is better not to run the risk of a relapse through over-excitement until the patient is able to stand the strain. On the other hand, a patient must never be allowed to become bored and weary, so the nurse will have to use her own judgment. It will be found that visitors are quite willing to be turned out of the convalescent room if the nurse considers her patient is becoming tired and strained.

As regards food for the invalid it must be light and easily digestible and, of course, the individual taste must be considered. Nourishing soups such as beef-tea and chicken soup are, as a rule, appreciated by most invalids. Milk, either alone or with soda water, and egg-flips or thin arrowroot, should be given. Another point to bear in mind is that the patient may only be able to eat very little at a time, so he must be tempted to eat or drink at least every three hours. Breakfast should consist of either half a grape-fruit, or the juice of an orange, a small pot of tea and some toast or thin bread and butter. It is a mistake to send too much at first unless the patient's appetite is normal; the sight of too much food often causes an invalid to shudder and turn away from it, whereas a tray daintily set out with just enough to tempt the appetite may cause him to ask for more. An egg-flip with a little sherry or brandy mixed with it should be given about eleven o'clock, and one or two plain biscuits should be sent in with it. The

midday meal at first may consist of chicken jelly or soup, mutton broth or any such light nourishing substance. Milk puddings and custards should be made with fresh milk and eggs. As the appetite increases, more solid foods such as roast chicken, steamed or boiled fish, roast mutton or grilled mutton chop, sweetbreads or tripe and vegetables may be added to the diet. It is a mistake to ask the patient what he would like to eat; as a rule the answer is "nothing," but a request for any particular form of food should not be ignored if it is at all advisable for the patient to have it.

Care of the Patient.—If the patient is in a very weak and debilitated state, everything possible should be done for him until he regains his strength. The patient should be sponged over at least once during the day, and the hands and face sponged morning and evening. The back and limbs should be massaged daily with methylated spirit or cheap eau-de-Cologne in order to prevent bed-sores forming. Absolute cleanliness should be maintained and care must be taken to see that the skin is properly dried. Dry skins should be rubbed with equal parts of methylated spirits and oil, as this prevents cracking. After massage has been carried out the body should be powdered over; equal quantities of oxide of zinc, boracic, and starch powder make a very excellent and reliable dusting powder.

Tonics.—In most cases a tonic is necessary to give tone to the system and to stimulate the appetite. There are many iron preparations which may prove very helpful to the patient such as Parrish's Food, Easton's Syrup or Blaud's Pills. Children should be given cod-liver oil and malt. Very often a change of air to a bracing climate will tone the patient up and do much to bring him back to a normal state of health. Very old people, or delicate or very young children, should not be taken to too bracing a climate as this may do more harm than good. A mildly bracing place should be chosen at first; and not less important are the possibilities of securing suitable diet and cooking and cheerful surroundings.

CONVULSION.—A convulsion, commonly called a fit, is a violent irregular motion of the whole body or of part of the body, due to involuntary contractions and relaxations of the voluntary muscles, and may be compared to an earthquake in the system. The most common convulsions are those which occur in infancy and are called infantile convulsions; those occurring during attacks of St. Vitus's dance called choreic from its other name of chorea; those due to epilepsy; to lockjaw (tetanus); or advanced kidney disease (uræmic convulsions). Women also suffer from convulsive fits during the latter stages of pregnancy (eclampsia) and during the menopause (climacteric). All these will be found under the diseases which cause them.

COPAIBA.—The oil of copaiba is largely used in cases of gonorrhœa as a disinfectant and stimulant. It is a golden-brown fluid with a peculiar odour and very bitter taste, and is obtained by incision from the trunk of trees, grown in the valley of the Amazon, and in the East and West Indies. The resin which remains after the oil has been distilled from copaiba is used to increase the flow of urine in cases of dropsy, but because of its liability to irritate the kidneys it should not be given in nephritis or Bright's disease. It is a particularly nasty medicine to take and the reason why it is very seldom used—except in cases of gonorrhœa, for which it would not be employed if it had not such a very marked beneficial action—is that it produces a strong and unpleasant odour in the breath of those who take it. The use of this drug may produce a rash in some people or symptoms of indigestion may appear.

COPPER.—Copper sulphate, more commonly known as blue vitriol or blue stone, is of considerable value in medicine. Used externally, the sulphate is applied as a caustic to reduce growths on the skin and an ointment of copper citrate is useful in the treatment of ulceration of the eyelids. Sulphate of copper is often used to kill germs found in reservoirs and to act as a disinfectant, but this procedure is not unattended by danger, as, owing to the amount required to be really effective, there is always a great risk that symptoms of poisoning may arise from consumption of the water. Copper oleate ointment may be used in the treatment of ringworm, also ulcers, warts and corns. Lotions of copper sulphate have been used for chronic forms of inflammation of the eye. Taken internally in small doses, copper sulphate is valuable for severe diarrhœa. It is particularly useful in phosphorus poisoning; three or four grains of the

sulphate in water should be given every few minutes until vomiting takes place.

Poisoning by Copper.—Large doses of salts of copper violently irritate the stomach and intestines, but as a rule acute poisoning is very rare. Copper may be taken in very small quantities over a long period without producing any ill-effects, but on the other hand symptoms of poisoning may arise causing severe colic.

Treatment.—Treatment consists of washing out the stomach by giving large quantities of warm water followed by white of egg or milk. If the pain is very severe, opium may be prescribed to allay the irritation.

CORD.—There are several structures in the body referred to as cords. The most important is the *spinal cord* which is about 18-inches in length, extending from the top of the spine to the upper border of the second lumbar vertebra; it is continuous with the brain. The *umbilical cord* is the cord by which the child is attached to the mother at birth. The *spermatic cord* extends from the abdominal ring to the posterior border of the testis and is composed of arteries, veins, nerves, lymph-glands and the ductus deferens. There are also *vocal cords* in the larynx.

CORN.—A corn or clavis is too well known to the majority of people to require a detailed description. It is a circumscribed overgrowth of the horny layer of the skin, occurring as the result of prolonged pressure due, of course, to the use of improperly fitting footwear. The corn has a deep core or "eye," while the surrounding parts are overgrown, and there may be a varying degree of inflammation.

The troubles which corns produce are often much in excess of their apparently small cause. As walking becomes very painful, the sufferer alters the normal position of the foot to gain relief, and may in time become flat-footed. Apart from local disabilities, the radiating or "shooting" pains of the corn may extend to the knee, and many people have been credited with "gout of the knee-joint" which entirely disappears with the removal of the corn, especially if flat-foot be at the same time corrected by suitably "built" shoes.

Treatment.—The true remedy for corns, then, is correctly fitting shoes. Without them all other measures are temporary and palliative only. Much may be done to stop the formation of corns by having several pairs of shoes and wearing them in turn. Each pair presses a little differently, and so lessens the chance of damaging one particular part. When a corn has formed, relief from pressure and consequently from pain is given by the well-known corn-plaster, which consists of an adhesive ring of cotton-wool which surrounds the corn. Strict attention to cleanliness of the feet, by daily bathing, also to some extent relieves the pain.

To remove the corn, it should first be softened by a thorough soaking in hot soapy water, to which sodium carbonate (washing soda) is added in the proportion of 2 tablespoonfuls to a basin of water. Soakings on several successive days may be necessary before the corn will soften. It should then be rubbed down as briskly as possible with pumice-stone or a friction cloth.

The central core and the surrounding callosity can also be softened by various medicaments. A rapid method, which is best used only by a medical man, is to place a drop of liquor potassæ, 15 per cent., or strong acetic acid on the corn, and rub in as vigorously as can be borne. The horny layer is rapidly dissolved into a greasy pulp. Both, especially the strong acetic acid, must be used cautiously, and not on any account allowed to touch the healthy skin. The acetic acid method is, in any case, somewhat painful. A milder, but still rapid, method is to apply liquor potassæ, 5 per cent., rub in, and immediately neutralize by a drop of dilute acetic acid or white vinegar.

Slower, but painless, methods consist in the use of milder horn-dissolving agents, the chief of which is salicylic acid, used either as a "medicated plaster" or as a paint in combination with collodion. The plaster consists of a small centre of salicylic plaster, surrounded by an ordinary corn plaster. The medicated part should be placed over the corn, and the whole kept in place by a narrow strip of surgical plaster. It should remain in place for three days; it will then be found that the superficial part of the core and the surrounding horny part will have softened, and may easily be removed.

In obstinate cases, ionization with zinc, or treatment by X-rays, have been used. Surgical removal is sometimes resorted to as when the central core is very deep it cannot easily be treated by medication. This is a

matter for the doctor, and should under no circumstances be undertaken by the patient, absolute surgical cleanliness being a necessity in this, as in every operation. Many a person has lost, if not his life, at least his foot, through a carelessly cut corn. If, however, poisoning occurs at the site of a corn, treatment should be that of an acute abscess. The most sensible procedure is for the patient to consult his doctor as soon as possible.

"Soft" corns belie their name by being very troublesome. They occur in any position between the toes, and even after what seems to be a complete removal are exceedingly apt to recur. Cleanliness of the feet is here even more important than in the case of hard corns, especially if there is much sweating of the feet. The most suitable application is spirits of camphor, which should be painted on at night; during the day zinc oxide or talc powder should be used, and wool placed between the affected toes. A powder containing starch (as do many toilet powders) should not be used, as it is apt to irritate a damp skin. These are, naturally, only palliatives; the most satisfactory method is surgical removal which, however, may need to be repeated if the corn recurs. *See also* SUPPLEMENT ON BEAUTY CULTURE.)

CORNEA, THE.—The cornea is the window of the eye. It is a transparent membrane covering the iris and the pupil. At the side of the eye it joins the white. It is well supplied with nerves, and so is extremely sensitive.

Ulceration of the Cornea.—The cornea is readily damaged when the eye is exposed for any length of time to an irritant. This destructive process is called ulceration. An ulcer may occur at any point on the cornea, and, when it heals, an opaque scar is left. Sometimes the ulcer eats through the cornea and damages other structures in the eye. Any degree of damage to the sight, from a mere cloudiness to complete blindness may be caused.

The *cause* is a wound of any sort, from a slight scratch to the most serious damage. In a good many cases the eye is in an unhealthy condition before the injury takes place. For example, many varieties of conjunctivitis may lead to ulceration.

The **septic ulcer** is one of the most important and serious forms, as "it is the most frequent cause of loss of sight amongst active workers with the hands." Some of the worst cases occur among farm-labourers and miners. Two or three days after the injury a severe gnawing pain in the temple begins, so bad that the patient "walks the floor" at night, and soon becomes badly worn as the result of sleeplessness. Unless treated, the ulcer tends to wander over the cornea, and may attack neighbouring parts.

Treatment.—To prevent this, it is necessary to destroy the active margins, from which the spread goes on. This is done by "touching" the ulcer with carbolic acid or the cautery. Another very important part of the treatment is to attend to any accompanying disease of the eye. When the condition begins to improve, the healing process is hastened, and the scar tissue cleared up as far as possible, by the daily application of iodine ointment and massage, which combined treatment is most valuable.

Strumous ulcer shows a great variety of forms. It occurs in children, generally between the ages of 5 and 10, who usually come from poor and neglected homes, and who are "below par" in every way. Skin disease frequently starts the infection, and tubercular glands in the neck are almost always found. This form of ulcer may be diagnosed by simply observing the child; there is no eye disease in which dread of light is so marked. Any attempt to open the eye he resists to the utmost. The eyelids are swollen, red, and painful, and there is a constant running of tears, so much so that the skin is raw from the irritation. At one point on the cornea will be seen a dull great opaque spot, or in some cases a tiny blister, which is the commencement of the ulcer, together with a "leash" of blood-vessels running to the affected spot.

Treatment.—These cases are always more satisfactorily nursed away from home. The eye is treated with an antiseptic wash and ointment. The diet is carefully regulated, and laxatives, tonics, and cod-liver oil given. A warm bath is given daily. Till the dread of the light lessens, the child may have an eye-shade, but no bandage. In most cases, the outlook is quite good, and daily massage with iodine ointment does much to improve matters.

A strumous ulcer may occur in adults, in which case the outlook is not so good. The treatment is the same for adults as children.

Other conditions in which blisters may form on the cornea are *Herpes*, *Glaucoma*, *Recurrent Vesicle*, and "*Fever blister*," which, however, may easily be distinguished from the above.

Dendritic ulcer is so called because the shape of the ulcer resembles branching twigs. It may occur after a debilitating disease, or in old people or unhealthy children. It is supposed to be due to the growth of a tiny fungus. The symptoms resemble those of a mild conjunctivitis.

Treatment.—The usual treatment is to destroy the ulcer with absolute alcohol. Afterwards, the eye is washed out regularly with a disinfectant solution. Great attention should be paid to the general hygiene.

Keratitis.—The term keratitis is used to denote inflammation of the cornea without ulceration. The most important form of keratitis affects children at about the age of puberty, sometimes several members of the same family, and girls rather than boys. The cause in the great majority of cases is congenital syphilis, other signs of which may be present. Injury is quite frequently the exciting cause which lights up the disease.

Symptoms.—Two common forms of the disease are seen. In the *mild* form the eyes easily tire, and vision is blurred. Greyish spots are seen on the cornea. The patient recovers in a few weeks. In the *severe* form the symptoms are much more acute; pain, especially, may be very distressing. The cornea becomes obscured by closely-packed blood-vessels which from their appearance are called "salmon patches." In the course of a few weeks the patient is practically blind, but recovery takes place in 6–12 months. The outlook is generally good, unless complications occur.

Treatment.—The eye is treated by atropin drops. Syphilitic treatment is given, and the general hygiene is carefully regulated. A difficulty in many cases is that the patient loses interest in everything but his own "hopeless" condition. Both he and his family should be made to realize that this despairing frame of mind is quite unnecessary, as his blindness is only temporary.

Conical Cornea.—In this condition the cornea, instead of being a flattened curve, rises up into a cone-shaped prominence. It is corrected by glasses or by an operation.

CORPULENCE.—This term is applied to an over-abundance of fat on the body. Certain cases of corpulence may be due to diseases; but as a rule, excessive fatness is due to over-eating and over-drinking, especially in those who lead a sedentary life. It is quite true that a person can be quite corpulent and yet enjoy almost perfect health; nevertheless, excessive fat may lead to serious disorders, especially if it forms around such organs as the heart, kidneys and liver, etc. (*See also* OBESITY.)

CORPUSCLE.—This word literally means a little body. The blood-cells are called corpuscles. (*See also* BLOOD.)

CORROSIVE.—A corrosive substance is one which destroys tissues or any part with which it comes in contact. There are a large number of substances of a corrosive nature and many fatal accidents have occurred through drinking them. These poisons include the strong acids, strong alkalines and caustics. The more important acids include oil of vitriol or sulphuric acid, hydrochloric acid, nitric acid, oxalic acid, acetic acid and carbolic acid.

The more common alkalies which act as corrosive poisons include: caustic soda, caustic potash, washing soda in strong solution, and ammonia. Among the caustic salts are zinc chloride, silver nitrate and chromic acid.

Symptoms of corrosive poisoning come on very quickly after the acid has been taken. There is intense pain in the mouth, throat and stomach, followed by vomiting, which is usually blood-stained. There is generally great difficulty in breathing and the patient may die of collapse in a short time. Even if the symptoms pass off, there is great danger of the patient succumbing from destruction of the tissues, and perforation of the stomach.

Treatment.—The doctor must be sent for at once and, if possible, the nature of the poison should be stated; this may be ascertained from the label on the bottle from which the poison was taken. *On no account should an emetic be given, as this will cause further injury to the already damaged tissues and may cause perforation of the stomach.* Soothing liquids such as milk and white of egg, or a wineglassful of olive oil in the same amount of warm water, or gruel may be given. The antidotes for the common

types of poisoning are set out under POISONS.

Shock must be guarded against by keeping the patient as warm as possible. Hot-water bottles should be placed at the feet, sides and chest and warm blankets placed over him. The clothing should be loosened and the room well ventilated. Artificial respiration should be carried out if necessary. If these instructions are fulfilled promptly there is every chance of keeping the patient alive until expert medical attention can be given; in fact, the doctor may not find it necessary to do anything further. Strong tea or coffee, warm but not hot, may be given later as a stimulant.

CORROSIVE SUBLIMATE.—This is a salt of mercury known also as perchloride of mercury, mercuric chloride or bichloride of mercury. The chief use of this substance is as a disinfectant or antiseptic. It is one of the most powerful of all the antiseptics and even in very dilute solutions will kill virulent germs, but it must not be used on metal instruments because it corrodes them. Corrosive sublimate solutions are generally tinted blue in order that the distinctive colour may help to guard against accidents, as it is extremely poisonous. Mercury in any form is very beneficial in the treatment of syphilis, and the perchloride is often used for adults. It may be applied locally to syphilitic ulcerations and treatment should be begun as early as possible.

Cases of poisoning by this substance should be treated promptly by giving white of egg. An emetic should be given in this case as, in spite of the name of the poison, it does not act as a corrosive but as an irritant. (*See also* MERCURY POISONING.)

CORSETS.—Fortunately for the health and comfort of women, the days of injurious "tight-lacing" are well over. The modern corset is cut to fit, and acts as a comfortable control for the over-exuberant figure.

Special corsets are sometimes ordered. For instance, though as a rule an expectant mother needs no support, some have very slack abdominal muscles, which allow an uncomfortable tilting forward of the heavy womb. These patients are much benefited by wearing a maternity corset, which supports the abdomen without interfering with health by compression. A corselet should not be worn during pregnancy; if the breasts become uncomfortably heavy, they should be supported by a specially-cut brassière, which acts as a sling.

In mild cases of prolapse or "fallen womb," the patient will gain great comfort from a short corset, or belt, with a pad attached. The pad (covered with washable material, which should be renewed daily) covers the entrance to the womb, and acts as a support. It is far more comfortable and hygienic than the rings so commonly used.

Surgical belts and corsets are prescribed both for men and women in varying cases. Sometimes, for instance, in rupture; after operation; in curvature of the spine due to faulty position; in curvature due to disease, and so on. As each is individual to the patient, they cannot be described in detail. (*See also* ABDOMINAL BELTS.)

CORTEX.—The outer layer of an organ is called the cortex. The *cerebral cortex* is the thin layer of grey matter on the surface of the *cerebrum.* (*See also* BRAIN.)

CORYZA.—The medical name for nasal catarrh—running at the nose. (*See also* COLD, THE COMMON.)

COSTIVENESS.—Costiveness is another name for constipation. This term is often applied to small children. (*See also* CONSTIPATION.)

COTTON-WOOL.—Cotton-wool is made of the hairs of the seed of the cotton plant. It becomes absorbent after the fatty and oily substances have been removed; this is termed "absorbent cotton-wool" and it is used extensively in medicine. To mop out small cavities such as the ear or nose, cotton-wool should be wrapped round the end of a match or an orange-stick. The proper way to do this is to take a small piece of cotton-wool and place the end of the stick in the middle and twirl the cotton-wool well round with the tips of the fingers. When mopping out the nose or ear of an infant it is better not to use a match as this may cause damage to the delicate organs; the cotton-wool twisted by itself will be found quite adequate. Cotton-wool is *very* inflammable and many accidents have been caused by its use on fancy-dress costumes. Christmas-time especially, when children are running around with lighted candles or playing with fireworks, is a very dangerous time as there always seems to be lots of cotton-wool about on Father Christmas and the Christmas-tree. On the other

hand, cotton-wool when purchased from the chemist is in a highly compressed state and if it is warmed a little in front of a fire it will fluff out and be much more economical to use, but this should only be done by a responsible person and never by a child.

COUGH.—Cough is an important symptom in many diseases, and may be the chief thing the patient complains of. In other diseases, however, the cough may be so slight as to be hardly noticed by the patient and yet be important enough to lead the doctor to the correct diagnosis of the disease.

Act of Coughing.—Coughing is an action by which air is driven from the chest and throat in an explosive fashion. The impulse to cough is usually the result of some irritation of the various branches of a nerve called the "wanderer" or *vagus* nerve. This nerve gains its name from the way its branches wander over the body. It supplies among other parts the heart, the chest, stomach, the intestines, etc., and irritation causing the necessity to cough may arise in the breathing apparatus, the digestive system, as a result of heart disease, or as a purely nervous condition.

Varieties of Cough.—In diseases of the throat, the cough is usually hoarse, barking and "croupy." In ulceration or thickening of the mucous membrane of the throat, the cough may be husky and imperfect.

Cough in diseases of the Lungs.—In *bronchitis* the cough is at first short and dry and may be painful. As the secretion is increased it becomes moist, and may also be paroxysmal; there may be bouts of coughing and fairly long free intervals.

In *tuberculosis* cough is an early symptom. At first it is dry and hacking, later it becomes loose and is accompanied by expectoration mixed with slime and matter. It is often most severe in the morning. In some patients, especially lunatics, advanced tuberculosis may be present without any cough.

In *pneumonia* the cough is infrequent, short, dry, restrained and associated with severe pain in the side. In acute *pleurisy* the cough, although it is usually present, is seldom so noticeable as in acute pneumonia.

The paroxysmal cough of *whooping cough* is very characteristic; a series of coughs follow each other so rapidly that there is no time to draw in the breath between them. The patient becomes blue in the face, the veins of the forehead and scalp stand out, the eyes become prominent, and the tongue is often protruded. Bleeding from the nose may occur. At last a sudden inspiration takes place with a loud whoop. This may be followed immediately by a second or several series of coughs and whoops before the paroxysm is over. At the end of the paroxysm a quantity of mucus is generally expelled with some violence, and in young children vomiting is usual. During the attack the child may seize some piece of furniture for support.

Enlarged glands at the root of the lung may give rise to very severe and persistent coughing.

Diseases of the Heart.—Inflammation of the membrane lining the heart (pericarditis) is sometimes accompanied by a painful cough. Aneurysm is usually associated with a dry and brassy cough, either by direct pressure on the windpipe, or by irritation of the nerve which leads to the muscles of the throat. Any condition in which the heart's action is feeble, and where consequently the circulation through the lungs is carried on imperfectly, may give rise to a troublesome cough.

Cough in diseases of the Abdominal Organs.—The so-called "stomach" cough is associated with indigestion. It appears to be due to irritation of the back part of the throat and upper part of the food-pipe (œsophagus) caused by dyspepsia. It is common in children and is often associated with the presence of enlarged tonsils and adenoids.

Nervous Cough.—This term is applied to all forms of cough in which no definite cause of irritation can be discovered. It is often a mere habit, and it may be associated with emotion, especially that caused by speaking in public.

Hysterical Cough.—Cough is fairly common in cases of hysteria. It may be very severe and persistent and give rise to anxiety as to the condition of the lungs.

Diagnosis.—Some forms of cough are very characteristic, e.g. that of whooping cough, and the brassy cough of the sufferer from aneurysm. The greatest difficulties arise when there are no obvious diseases of the throat, chest or heart.

Treatment.—The treatment of cough due to diseases of the chest or of the heart will be found under the various headings

concerned. Where the throat is the seat of the irritation, gargles, sprays, pigments and pastilles are all useful; these include such remedies as medicated glycerine jujubes, lozenges of potash, linseed tea, barley water and blackcurrant jelly. If the cough is due to a relaxed throat, the back of the throat should be painted two or three times a day with an astringent such as glycerine and tannic acid, or with a weak solution of iodine, or the more specialized preparations such as Mandl's paint, etc. Removal of enlarged tonsils and adenoids, or of a uvula which is too long, may also be necessary.

Inhalations are of great value when the irritation proceeds from the larynx. Nothing is more effective in soothing laryngeal irritability, and the persistent cough which attends it, than the inhalation of the vapour from carbolic acid, Friar's balsam or menthol crystals.

Children who suffer from a cold on the chest may be relieved by rubbing the chest with liniment containing camphor and fitting a cotton-wool jacket. Food and fresh air should be supplied in a liberal quantity. A soothing mixture should also be given.

When the cough is loose and the expectoration is free, a stimulating mixture should be given.

COUNTER-IRRITANT.—Irritation of the skin in order to relieve pain or congestion of some part of the body is known as counter-irritation. This may be carried out by means of rubbing the skin with the hand, or by artificially producing a blister or redness by means of a drug. Counter-irritation is often applied to the chest in cases of bronchial catarrh by rubbing camphorated oil well into the skin. The number of diseases that benefit by counter-irritation are numerous, but this method appears to be especially beneficial in chronic inflammatory conditions such as rheumatism and bronchitis.

There are several groups of counter-irritants varying in the degree of severity of their action. Mild counter-irritants such as mustard, turpentine, camphor or iodine, which produce a feeling of warmth to the skin, are called *rubefacients.* Rubefaction is the medical term for the redness which appears on the skin after the application of such drugs. The more severe type of counter-irritant when applied to the skin produces small vesicles or blisters which run together, forming one large bleb full of clear fluid. Cantharidin is the most commonly used drug for this purpose and it is often applied to relieve pain in neuralgia. This type of counter-irritant is known as a *vesicant.*

Cautery is the most severe type of all and in this method the skin is actually burnt by means of electrically heated wires. This form of counter-irritation appears to prove of some value in the treatment of chronic inflammation of the bones and joints.

COURSES.—This is a popular term for the menstrual periods which occur in women. (*See also* MENSTRUATION.)

COURT PLASTER.—Court plaster is made from a solution of isinglass spread on to silk. Isinglass is a gluey substance obtained from certain species of the hake and sturgeon. Although court plaster has no healing qualities of its own, it is invaluable as a protection from dirt when applied to small wounds and cuts.

It derives its name from a fashion which was very popular during the early part of the 17th century when all court and society people wore little black patches on their faces. This fashion probably started as a means of hiding prominent pock-marks or spots.

COW-POX.—This is believed to be a form of smallpox among cattle, but which may be communicated to human beings who come in contact with it. It is a relatively mild disease showing none of the severe symptoms of smallpox. There is usually a slight rise in temperature, and a sore generally appears on whichever part of the body has come in contact with the diseased cow; generally on the hand through the process of milking. It was noticed that persons who had suffered from cow-pox did not develop smallpox, and it was this observation which led Jenner in 1796 to carry out, for the first time, vaccination of man with cow-pox lymph obtained from the hand of a dairy-maid. The lymph which is used nowadays is taken from the sores on a tuberculin-tested calf and, after being mixed with glycerine and water, is stored in a cool dark room before being used. (*See also* VACCINATION.)

CRACKS.—Cracks may occur in several parts of the body and where they are present should always be healed up as soon as possible, not only because they are usually painful, but also because they make an open doorway for the entrance of germs into the

blood. The most common cracks are those on the hands and lips. Cracks on the skin of the hands are called chaps, and are described in a separate article.

Cracked Lips.—Cracks on the lips are usually at the corners which are apt to be moist from the saliva from the mouth, or in the fullness of the lip where the cold winds catch it. The habit some people have of constantly moistening their lips with their tongue is very apt to cause cracks in the lips in cold, dry, windy weather. These may be very painful and are also very ugly.

Treatment.—The best way to prevent them and to cure them when they have occurred is to keep the lips moist in cold weather with a good cold cream, or plain lanoline, which is simply the purified oil obtained from sheep's wool, and cannot harm the most delicate skin. It is interesting to notice that chapped lips are far less common than they used to be and the explanation is certainly that most women now use lipsticks, even if they are only colourless ones, and these lipsticks are made of some simple and harmless greasing material, generally lanoline, white paraffin, or cocoa butter. Thus the lips are protected from both frost and cold winds and also in summer from excessive heat.

Cracked Nipples.—Another crack, that is common amongst mothers and can cause a great deal of trouble and excessive suffering, is the crack in the nipple. This crack comes a few days after the mother has begun to nurse the baby if she has not taken care to harden the nipples before her confinement and, as can be imagined, the pain when the baby suckles is very great, and in very many cases an abscess forms, and the baby may have to be weaned, at least for the time being. Great care should therefore be taken to prepare the breasts before childbirth by means which are fully explained in the article on PREGNANCY.

Cracked Fingers.—Cracks on the thumb or fingers are caused by the same things as chaps on the backs of the hands, generally when the hands have been exposed to cold and dry winds, or have been wet in the cold. These small but deep cracks can be very painful and a great nuisance, especially to a woman who has sewing or knitting to do.

Treatment.—They are difficult to heal unless they are covered with a finger stall to keep them from being continually torn open again. The hard edges of the crack should be rubbed off with pumice stone and the crack filled with an ointment containing salicylic acid and kept covered up until it is completely healed. To prevent chaps and cracks on the hands there is nothing so useful as glycerine in some form or other. It may be used in a diluted form mixed with rose-water and rubbed into the hands at night during the cold weather. Or there are many very cheap and convenient tablet and cream forms on sale, such as Melrose and Snowfire, which have the advantage that they can be carried about during the day and rubbed on each time the hands are dried after having been put in water.

Cracked Tongue.—Cracks in the tongue happen sometimes where there is a tooth with a rough edge, which constantly irritates the tongue, and sometimes without any such irritation when the stomach is upset and out of order. Excessive smoking may also cause cracks in the tongue.

Treatment.—Where they are present the teeth will have to be put in order and rough edges filed down. Any digestive trouble will have to be attended to and smoking cut down or given up. The mouth may be washed out frequently with glycerine of thymol. If the crack does not heal quickly a doctor should be consulted at once, as it may be the beginning of an ulcer, which may lead to more serious trouble.

Anal Fissure is a painful and troublesome crack in the skin of the anus, which is the lower opening from the bowel. As the stools are continually passing over the crack and infecting as well as irritating it, these cracks are very difficult to completely heal.

Treatment.—The part should be kept scrupulously clean and resorcin ointment may be rubbed over the crack before and after each motion of the bowels, whose motions should be kept soft, but not moving more than once or twice a day. If the crack does not heal it should be seen by a doctor.

CRAMP.—Cramp is a painful spasm of any muscle. The muscles which are most often subject to cramp are the muscles of the legs and feet. The attack may be due to lying or sitting too long in a strained position. As a rule the cramp passes off quickly. Exposure to cold, general debility, fatigue or gout are some of the conditions which may

produce cramp. Cramp is also used loosely to mean any colicky attack in the abdomen. Cases of drowning from cramp are usually due to heart failure. In cramp in a limb, the best way to relieve the pain during an attack, is to stretch the affected limb. This may be very difficult and extremely painful, but it is well worth the effort. If the victim is unable to do this, the affected part should be rubbed energetically until the spasm gives way. (*See also* COLIC and CRAMP in the FIRST AID SUPPLEMENT.)

CRANIAL NERVES.—These consist of twelve pairs of nerves, which come from the brain itself. They control the senses of sight, smell, hearing, speech, etc., also all movement and sensation about the head and neck.

CRANIUM.—The cranium is that part of the skull which contains the brain, though the whole skull is often wrongly referred to as the cranium. The bones that form the skull are divided into two classes, the cranial and the facial. (*See also* SKULL.)

CRAPULENCE.—This is a coarse state of body which results from an over-indulgence in food and drink. Ordinary alcoholic drunkenness may be described as a very good example of crapulence.

CREAM OF TARTAR.—Acid potassium tartrate is also known as bitartrate of potash or cream of tartar. In doses of ½ to 1 teaspoonful in half a pint of warm water, it acts as an excellent purgative for habitual sluggishness of the bowels. A very pleasant drink for feverish patients is imperial drink, which is made by adding a teaspoonful of cream of tartar to a pint of home-made lemonade.

CREEPING PALSY.—This is a popular term which is used by many people when they are describing symptoms of diseases such as disseminated sclerosis, spinal meningitis or general paralysis of the insane. It is a vague term and has no real medical significance.

CREOSOTE.—Creosote is obtained by the distillation of wood, the best kind being made from beech wood. Creosote has the same action on the body as carbolic acid, and has been used externally as an antiseptic. Creosote is largely used as an inhalation in bronchitis and lung complaints. It may be inhaled either from boiling water or by means of some form of inhaler, so that the vapour can be conveniently drawn into the chest through the nose and mouth.

Creosote is taken internally for vomiting and flatulence and it has been much employed in the treatment of tuberculosis and asthma. It should be taken in capsule form, diluted with a quantity of almond oil or cod-liver oil; dose 1 to 5 minims taken immediately after meals.

The ointment of creosote is made up with creosote, hard paraffin and white soft paraffin. It is used in various skin diseases such as dermatitis and inflammations of the skin.

CRESOL.—Cresol, or cresylic acid, is a straw-coloured liquid obtained from coal-tar by distillation. It becomes brown on keeping or on exposure to light, so should be preserved in stoppered amber-coloured bottles.

It is a powerful antiseptic, and the well-known disinfectant lysol is made from it. Jeyes' disinfectant also contains cresol. It is used in surgery and in domestic life as an antiseptic. A tablespoonful to 1½ pints of water is a convenient strength for disinfecting instruments, linen, drains, etc. For the hands, one tablespoonful to 2½ pints will be found strong enough.

Cresol has a reputation in the treatment of whooping-cough, when the substance is vaporized by heat. This may be carried out by pouring a teaspoonful of cresol on to a heated metal plate, or a special vaporizer can be obtained for the purpose.

Cresol and its various preparations being so common, have led to many cases of poisoning. The symptoms are very similar to those of carbolic acid poisoning. The stomach should be immediately washed out by copious draughts of water or by means of a stomach tube, and then white of egg or olive-oil should be given to prevent the poison being absorbed into the stomach.

CRETINISM.—A cretin is a child who suffers from a peculiar form of idiocy, owing to the absence or deficiency of the juices of the thyroid gland. This gland lies in the front of the neck and it plays a very important part in the physical and mental well-being of human beings. The thyroid gland is one of the ductless glands of the body whose juices are carried directly into the blood-stream. (*See also* DUCTLESS GLANDS.)

Cretinism seems to be more prevalent in certain parts of the world than in others, and it may be possible that atmospheric and geographical conditions play some obscure part in the non-development of the gland.

Cases are very common in Switzerland, Northern Italy, and France, but cases have been known to appear in England and America.

Symptoms.—If a child is born with the thyroid gland undeveloped, nothing unusual is noticed until the child reaches the age of about nine months. It will be noticed then that the child is backward, and physical as well as mental signs begin to develop. The head appears to be large and flat, and the tongue is unusually large and tends to protrude. The hair becomes thin, and the skin appears to be very dry. The abdomen is seen to be very prominent and the back is curved in. Speech, if it develops at all, is very late and defective. Quite a number of these children die young, but there are many who grow up. They are never anything else but idiots; and they remain dwarfed, rarely attaining the height of four feet.

Treatment.—Treatment should commence immediately the condition is discovered. Continuous administration of thyroid gland extract is necessary to make up for the deficiency in the patient. The child will, under this treatment, begin to react very quickly, and so long as the treatment is kept up will reach almost normal standard.

CRICK.—This term is applied to a type of pain which occurs generally in the back of the neck after holding the head in a strained position for any length of time. It usually comes on quite suddenly and may disappear just as suddenly. A little gentle massage may help to make the pain disappear.

CRISIS.—The word crisis as used in regard to illness means a turning-point, and is used to mark the moment in severe illness when the patient suddenly takes a turn for the better and the high temperature drops quickly. As a general rule the more quickly the temperature rises in the first place the more quickly it will fall when the crisis is past. The most marked crisis is that which occurs in pneumonia. The patient has been getting steadily worse and the fever and breathing are very bad. The crisis arrives almost always on the ninth day, though occasionally it is a rapid crisis and occurs on the fifth day. Everyone waits anxiously for the eighth or ninth day and the crisis. The patient is now desperately ill and it does not seem that he can hang on to life much longer. Then the observers notice that his skin has become moist and cooler, he may pass a large quantity of urine and will drop into the first quiet sleep he has had for days. From that moment recovery should begin and go on gradually. Other severe fevers, such as measles, influenza, etc., have a minor crisis when the fever has reached its height. This is often as soon as in twenty-four hours after the first rise of temperature.

The word crisis is also sometimes used to denote an attack of pain in the illness called locomotor ataxia.

It has been explained that crisis means the rapid drop of temperature in severe illness, but it happens in some diseases that the drop of temperature is slow but sure, and the patient recovers very gradually. This sort of ending to an illness is described as an ending by lysis, not crisis.

CROTON OIL.—Croton oil is an exceedingly powerful purgative, and is far too drastic in its action for ordinary purposes. It should only be given in very obstinate cases of constipation, and never if the constipation is due to any internal obstruction. Not more than one or two drops should be administered and generally one dose is sufficient. It should never be given to children or pregnant women, or to patients who are in a feeble state of health.

Owing to the very small amount required to produce a satisfactory result, this drug is a useful purgative for lunatics who refuse to take anything, or for unconscious patients, because in such cases it is swallowed automatically when placed on the back of the tongue.

Croton oil was formerly applied to the skin as a remedy for inflamed joints, bronchitis and pleurisy, but the effect on the skin was so drastic and the inflammation so severe that the remedy was found to be worse than the disease. Even a little croton oil spread over a very small area will cause acute inflammation and intense pain and the surrounding skin will also become red and swollen. Unsightly scars are left after the spots have healed. The drug should be diluted with olive oil, butter or sugar, in order to prevent inflammation of the tongue.

CROUP.—This is a condition of difficulty in breathing accompanied by a harsh cough. It is due to a spasm of the muscles which guard and control the entrance to the lungs.

Causes.—In young children the portion of the voice-box containing the vocal cords, which is known as the glottis, is so small that the slightest swelling which narrows the opening, or the presence even of a little mucus causing a blocking of the passage, will give rise during the night to attacks of suffocation which may be very terrifying.

Symptoms.—The child is usually between the ages of 2 and 5 years, and seems perfectly well during the day, though he may possibly have a slight cold. He wakes up suddenly about 11 p.m. with intense difficulty in breathing. His breathing is jerky, air is drawn into the lungs noisily and it makes a whistling sound. There is also a hoarse cough. After a period of time varying from a few minutes to an hour or more, the attack ends and the child falls asleep again as though nothing had happened. These attacks may be repeated night after night.

Although it is very alarming, croup is rarely fatal, and simple treatment is all that is necessary to stop the attack.

Treatment.—The attack of difficulty in breathing which naturally inspires so much alarm is treated by applying to the front of the neck a sponge or handkerchief soaked in water as hot as possible, taking care not to burn the skin. The handkerchief should be wrung nearly dry. The water should be changed and the sponge or handkerchief kept hot until the suffocation has disappeared. Between the attacks the child should be kept in a warm room, and a steam kettle should be used. The bowels should be kept open regularly. The child must be kept as quiet as possible and all excitement and irritation should be avoided. If the condition of rickets is present this must of course be treated.

Other Conditions which resemble Croup are:

Congenital Laryngeal Stridor.—This is a condition which is present at birth or just after. The difficulty in breathing is continuous and ceases after a few months. It does not cause any distress and is never fatal.

Catarrhal Spasm of the Larynx.—In these cases there is some degree of cough or hoarseness present. The onset of the attack is fairly rapid, but not sudden as in false croup. The breathing is not jerky. It is never fatal.

Catarrhal Laryngitis (Acute laryngitis). In this case there is a history of a previous cold, difficulty in breathing and some degree of fever. The difficulty in breathing becomes steadily worse and lasts longer each time. The condition may be a simple sore throat or it may be due to diphtheria.

Whooping Cough.—In this case there will be the characteristic "whoop."

Enlarged Tonsils and Adenoids.—These may cause some obstruction to breathing and produce a noise very similar to that of croup. The treatment is to remove the tonsils and adenoids.

CROWING.—This is also called laryngismus stridulus, laryngospasm or croup, and is a form of convulsion affecting the muscles of the throat, causing the patient to make a crowing noise rather like the whoop in whooping cough. It is a condition which affects children between the ages of 6 months and 2 years. It is found to occur in children who have rickets, and adenoids are frequently found to be present. (*See also* CROUP.)

CRUTCH.—A crutch is an appliance which is used to support the weight of the body when a patient is suffering from a diseased or injured limb. The head of the crutch, which consists, in the simplest form of crutch, of a cross-piece at the top of a wooden pole, should be well padded to prevent undue pressure on the armpit, otherwise the nerves of the arm may become paralysed.

There are various forms of crutches to be had and, as a rule, they have an additional cross-piece half-way down the leg of the crutch which can be grasped by the hand in order to relieve some of the pressure under the arm. A spring apparatus may be had which is fixed on to the middle of the arm, thus doing away with any pressure on the nerves of the armpit, and lessening the risk of crutch paralysis.

CUBEBS.—This drug is obtained from the dried unripe full-grown fruit of a plant known as the piper cubeba which is grown in Java. It is largely used as a remedy for bronchitis or chronic sore throat. Asthma is sometimes relieved by smoking cubebs cigarettes, and the powder when blown into the nose is excellent for chronic nasal catarrh or hay fever. Many popular throat lozenges contain cubebs, and they are especially useful to speakers as they keep the throat in good condition. The oil of cubebs is given in the treatment of gonorrhœa.

CUPPING.—This term is applied to a method of treatment which is used to relieve

congestion or inflammation of an internal part of the body. It is a very ancient form of treatment, and in the olden days a horn was used instead of the modern glass vessels. A cupping-glass should be able to hold about four ounces of fluid, and the edges of the glass must be smoothly ground.

The air inside the glass must be heated before applying the glass to the part to be treated. This can be done by moistening the inside with methylated spirits and setting it alight. The cup is immediately applied to the skin and thus a vacuum is created. The blood is in this way drawn to the surface of the skin under the cup and the internal congestion is relieved.

This is known as dry cuppings; but if it is desired actually to draw off blood from the skin a method known as wet cupping must be carried out. After the cup has been applied and the skin appears swollen inside it, the cup is removed and a number of incisions are made in the skin. Immediately this is done, another heated cup is placed over the part and left until the blood has been sucked into it. The instrument which is used to make the incisions on the skin is known as a scarificator. Cupping-glasses with a suction bulb attached may be had and in this way the air can be exhausted and a vacuum created instead of using heat.

CURD.—When milk enters the stomach, the part of the milk called caseinogen is fermented into solid casein thus forming a curd. (*See also* CASEIN.)

CURETTAGE.—This term is applied to an operation in which the interior of the womb is scraped with a *curette*. A curette is an instrument shaped rather like a spoon with a long handle, which varies in size according to the circumstances of the case.

One of the commonest causes for this operation is the removal of fragments of the products of conception, which if left in the womb would result in inflammation and infection. It frequently has to be performed after a miscarriage.

CURVATURE OF THE SPINE.—The normal movements of the spine are forward, backward and sideways, but if any exaggeration of these movements appear, curvature of the spine may result. For full particulars *see also* SPINAL CURVATURE.

CUSPARIA.—This drug is an aromatic bitter more familiarly known as angostura. It is obtained from the dried bark of the cusparia febrifuga, a tree which grows in South America. The natives of South America and the West Indies use cusparia a great deal as a remedy for diarrhœa, dysentery and dyspepsia. (*See also* BITTERS.)

CUTICLE.—The cuticle is popularly used to refer to the layer of skin which grows round the base of the nails, but it is really the outer covering protecting the whole skin of the body. (*See also* SKIN.)

CUTIS.—The true skin. (*See also* SKIN.)

CUTS.—A cut, however small, should be thoroughly cleansed before one tries to stop the bleeding, in order to avoid a septic (poisoned) wound. The simplest way is to hold the injured part under a running cold water tap for a few minutes. The surrounding parts should be washed away from, never towards, the wound. Broken glass, etc., should be removed if seen; the cut should not be probed.

After washing, mild tincture of iodine should be dabbed (not rubbed) freely over the cut and the surrounding skin, and a clean dry bandage put on. A perfectly clean handkerchief is suitable. Sticking-plaster or ointment should not be applied.

Even fairly profuse bleeding may often be stopped by a firmly applied bandage; boracic powder is sometimes useful. For more serious cuts, where the bleeding cannot be stopped, a tourniquet should be put on above the wound, and medical aid summoned at once. (*See also* FIRST AID SUPPLEMENT.)

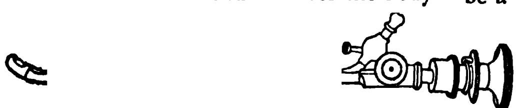
CYANOSIS.—This term is applied to a bluish discoloration of the skin which is due to the blood not being properly mixed with oxygen in the lungs. It may be a symptom of heart disease, or lung disease such as pneumonia, but by far the most frequent cause is a disturbance of the nervous system, owing to the presence of poison in the body. When people begin to look blue (or cyanosed) it is generally a sign that some illness is beginning, though in some cases it may be very slight indeed. There is a type of person who is always cold, and rather blue looking, but these people are generally the unhealthy type, and there may be no definite symptom of heart disease causing the blueness. Certainly a weak heart is known to produce blueness round the lips, etc., but every case of blueness is not due to heart disease. Very often the unfitness which produces cyanosis

is caused by poisons due to habitual constipation, *and the blueness will disappear as soon* as the body has been cleared of the poisons. Rheumatic people very often show signs of blueness just before they are going to have an attack of their condition; so also do people who have recurrent attacks of malaria. Many women have a blue and cold appearance just before the commencement of the menstrual period.

In certain conditions cyanosis may prove a very grave sign; but again, there are degrees of this condition which may go on for years without causing any disturbance to the patient.

CYSTITIS.—This means inflammation of the bladder. It is usually due to infection by a germ, together with a lowered state of health. Some types of germs are so powerful that they alone will cause inflammation of the bladder, but these are not common.

The causes which tend to lower the body resistance are, injury or congestion of the bladder wall and stagnation of the urine. Stagnation of the urine may be due to a variety of causes in the passage from the bladder to the exterior (the urethra), such as stricture (narrowing of the passage), enlargement of the prostate gland which surrounds the neck of the bladder, the presence of stone or other foreign body; and also to various conditions affecting the nerve supply to the bladder.



Cystoscope

Congestion of the bladder may be due to inflammation of the neighbouring structures such as the womb, to tumours of the bladder, etc. Damage during pregnancy or after childbirth is also quite a common cause.

The actual cause, the presence of virulent germs, may arise in the urethra; or the germs may descend from the kidneys down the ureters. Germs are more liable to enter the female bladder from below—than the male—because the female urethra is much shorter than the male. The passage of a catheter may be followed by inflammation of the bladder.

Symptoms of Acute Cystitis.—Pains in the lower part of the belly, also agonizing pain in the bladder and at the end of the penis in the male, after passing water. Water has *to be passed frequently and urgently. The* water contains an abundant deposit of slime and pus with perhaps blood in varying quantities.

Treatment.—Rest in bed and food consisting of a milk diet are necessary. The pain is much relieved by hot hip-baths, of which two or three a day may be taken lasting for 20 minutes. Hot fomentations should be applied to the skin over the bladder. The bowels must be kept open with suitable aperients. Alcohol in any form is not allowed. The catheter should not be passed while the condition is acute, nor should any attempt be made to wash out the bladder. Sedative medicines should be given.

Chronic Cystitis.—Here there is some pain, but usually much less than in the acute stage. There is more a feeling of weight in the lower part of the belly. There may still be a desire to pass water frequently and to evacuate the bowels. Damp and cold, sexual and alcoholic excesses will make the discomfort worse.

The water is cloudy, smells offensive and may be difficult to pass. It often contains pus and blood and is frequently alkaline. Of the complications of cystitis the most serious is infection of the kidneys.

Treatment.—This depends on whether the germ causing the cystitis makes the water acid or alkaline. When the water is acid the germ is either that of gonorrhœa or one known as the bacillus coli, a germ which normally lives in the large intestine. Drugs are given which tend to make the water alkaline. Citrate of potassium and bicarbonate of soda in large doses are given three times a day. The patient should not get up from bed till the condition has cleared up, as relapses are common. After a few days the water must be made acid. Making the water alkaline has prevented a great deal of activity on part of the germs, and has relieved the symptoms, but the only effective disinfectant of the bladder known is hexamine or urotropine, and it will only work when the water is acid. The water, then, is made acid by giving sodium acid phosphate, and the hexamine is given in fairly large doses. There may be a temporary aggravation of symptoms such as some discomfort and frequency in passing the water, so the patient should be warned of this in order to prevent

disappointment. The hexamine is usually effective in clearing up the infection. In the case of gonorrhœa, of course, the local infection must be treated at the same time.

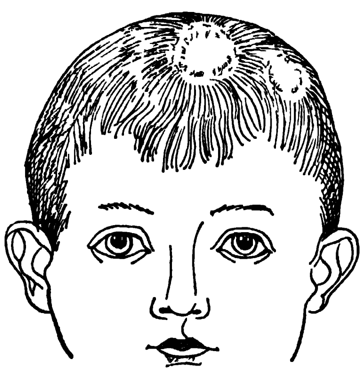
Local treatment may be carried out by washing out the bladder.

An antiseptic fluid is introduced by way of the urethra into the bladder two or three times a day. The bladder is washed out again and again until the returning fluid is quite clear. The fluid used is usually silver nitrate.

Further Points.—The drinking of large quantities of water is very important. At least a tumblerful of fluid should be drunk hourly in the early stages. Some caffeine may be combined with the drinking-water to stimulate the action of the kidneys. A large quantity of fluid acts mechanically and helps to clear the membrane of the bladder from its germs; it also keeps the urine dilute. No food must be eaten which is liable to act as an irritant in the urine.

Effect of Climate.—The bladder is very sensitive to variations of temperature and relapses are frequent from the effect of cold. Chronic sufferers, especially when the cause of the trouble is the germ of tuberculosis, are often much improved when they go to a warmer place to live.

Vaccines.—These are very useful in some cases. This should be "autogenous," that is

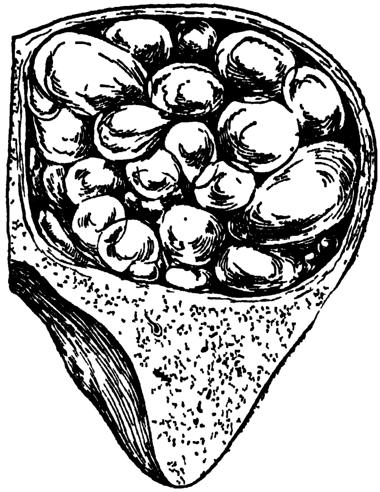


Sebaceous Cysts on Scalp

to say, it should be made from the germ causing the cystitis *after* it has been isolated.

The treatment must be continued until the urine is quite free from anything abnormal.

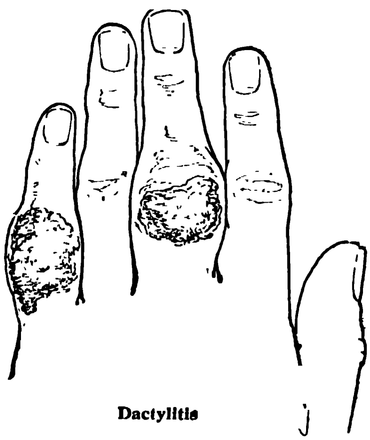
When antiseptics are being given it is not an advantage to drink large quantities of fluid as this also dilutes the antiseptic. A good plan here is to give large doses before going to bed, and to limit the fluids during the evening. Should the patient have to pass water during the night, however, this manœuvre loses a great deal of its value. (*See also* BACILLURIA, BLADDER.)



Hydatid Cysts in Liver

CYSTS.—Cysts of one sort or another are tumours or swellings filled with fluid or semi-solid substance. They grow in almost any part of the body and vary in size from little pea-sized lumps to great unsightly growths, which are very disfiguring. Some sorts of cysts are dangerous to life, but many are harmless, though ugly and uncomfortable. A few varieties will be mentioned below. The commonest variety of cyst is the *sebaceous cyst* or *wen*, which is formed by the blocking of the sebaceous or fat glands of the skin. These wens may grow in any part of the body, but are most common on the face, neck and head. A curious variety of cyst is the *dermoid cyst* which is present at birth, but usually does not develop until later in life. It is usually found on the face and contains such substances as skin, hair and even teeth. *Hydatid cysts* are dangerous cysts which are caused by a worm resembling the tapeworm. This worm inhabits the intestines of sheep and dogs and is conveyed to human beings by these animals. They usually occur in the liver or lungs. *Ovarian cysts* of various sizes are fairly common in women, and in some cases grow to astonishing sizes. For further information about any of these varieties of cysts look under their own headings.

DACTYLITIS.—This word literally means inflammation of the finger (from the Greek work dactyl, a finger). It is a condition which starts in one of the small bones of the finger and is nearly always tuberculous in origin. It may be a sign that tuberculosis is present in some other part of the body, so it is necessary that the general health should receive attention. Dactylitis may also occur in children owing to inherited syphilis. The diseased finger usually requires to be operated upon, and if the condition is due to tuberculosis, the treatment



Dactylitis

will take the form of plenty of fresh air, good food and sunlight.

DALTONISM.—This term is applied to colour blindness. The condition was named after John Dalton, an English chemist, who died in 1844. He was the first to give an accurate description of the condition in which he was interested, because he himself was colour-blind. (For full description of the condition *see* also COLOUR-BLINDNESS.)

DAMP.—Damp plays a very important part in many illnesses, and there is no question about the fact that it is the actual cause of certain diseases. If the air is saturated with moisture, the skin is unable to get rid of the normal amount of sweat which is necessary to perfect health. Wherever there is dampness there is always a feeling of chilliness, even in spite of a fire. A hot and moist atmosphere is very harmful because this also interferes with the proper evaporation of perspiration and a feeling of heaviness is the result. Workers in cotton mills suffer a great deal from lung troubles such as bronchitis and pneumonia through getting their clothes wet by too much perspiration and by not having them properly dried before going out into the air.

Cold, damp air is most harmful to people who suffer from rheumatism and neuritis as it seems to make their pains worse. It is a very common thing for people to say that they know when it is going to rain because they feel it in their bones. Sometimes corns have jumping pains, or an old scar may feel unusually tender. This is owing to the fact that the increased moisture in the air causes the skin to swell.

It is a well-known fact that germs, especially the germ of tuberculosis, will thrive in a moist atmosphere, but are destroyed when exposed to the sun. Many diseases appear to occur more frequently in damp climates. Bronchitis and pneumonia are among the more common and are especially prevalent in this country, where we seem to have more than our share of dampness. (*See also* CLIMATE.)

DANDRUFF.—Dandruff, or scurf, is due to a mild chronic inflammation of the skin of the scalp. The inflammation may be present for many years, the only disturbance being a slight itching. The head is "scurfy," i.e. the horny cells of the scalp are shed in large numbers and form scales; and there is a tendency for the hair to come out. Each fallen hair is replaced by one thinner and weaker, until the hair is seriously thinned. Finally, the hair roots become atrophied, and baldness results.

This is one of the commonest of skin diseases; it has been estimated that one in every three people is affected. It is chiefly due to local causes, the commonest being neglect of washing, brushing, and combing, with the consequent accumulation of cells and dried perspiration upon the scalp. Too vigorous brushing and combing, the use of harsh drying shampoos and lotions, the excessive use of oils, and anything which hinders the natural perspiration of the scalp (tight hats or head-dresses, "transformations," etc.), also cause the condition. Many sorts of germs are found upon the scalp, and these, though they do not cause the inflammation, help to keep it up when it has once started. Hence borrowed or dirty brushes and combs should never be used. Some people, such as

those with tender skins, which turn red and are irritable on very slight provocation, are especially liable to dandruff. Acne or rosacea, oily skins, a tendency to kidney or rheumatic troubles, defective digestion; other scalp troubles, such as boils, seborrhœa, and wounds are frequently accompanied by dandruff.

Treatment.—This long list of causes shows that the treatment must be general and preventive, as well as local. The *preventive* treatment consists in avoiding anything harmful to the scalp, and due attention to the hair. The *general* treatment consists in regulating the diet and attending to the ordinary rules of hygiene.

The milder cases of dandruff should be cured by regular care of the hair. If possible, it should be washed daily, and the juice of half a lemon mixed with the final rinsing water.

The cure of a well-established case requires endless patience and care, as the condition is very obstinate. Ladies with long hair would be well advised to have it cut, as the applications of medicaments to a scalp covered by long hair is not only very tedious and difficult, but the resulting appearance is far from attractive.

Many substances have been used, such as sulphur, salicylic acid, resorcin, iodine, pyrogallol, etc. (Fair-haired people should avoid the use of any but the first two, as the others darken the hair.) The most valuable of these is sulphur, which may be applied as an ointment or emulsion, the latter being the cleaner method. The preparation is applied at night and well rubbed in, and a linen cap worn. A bathing-cap, so often advised, should *not* be worn; it is most unhealthy for the scalp. The sulphur is allowed to remain on for ten days and then washed off; after which the treatment is repeated until the cure is complete.

Since light treatment and X-rays produce such wonderful results in other cases of chronic inflammation, it was hoped that they would be equally successful in cases of dandruff, but the results have been disappointing. Improvement may occur at first, but the condition soon relapses, and may even be aggravated. (*See also* SUPPLEMENT ON BEAUTY CULTURE.)

DANGEROUS DRUGS ACTS.—These acts were passed by Parliament between the years 1920 and 1923 in order to prevent the sale of dangerous drugs such as opium, morphia and cocaine except in special circumstances. They can only be obtained from a chemist with a medical prescription; and this prescription may only be used once and must be renewed if more of the drug is to be obtained. If a medical man is found to be giving these prescriptions too freely he is liable to have his name put on a list of doctors from whom chemists are not allowed to make up prescriptions for these drugs. The chemist who supplies the prescribed drug has to keep a record of it in a special book, which can be referred to if occasion arises.

DAY-BLINDNESS.—This is an irregularity of the sight, in which objects cannot be well or comfortably seen either by daylight or by strong artificial light, but are seen more clearly and comfortably by a half-light, as in shadow or twilight.

It is not a disease in itself, but a sign of disease, and may be caused by various conditions. There may be a thickened area or "blind spot" in the central parts of the eye, with the result that the vision is obscured when the pupil of the eye is small, as it is in bright light, but becomes clearer when the pupil grows large, as it does in poor light. If there is irritation or inflammation of the lids, or eye, or if the eye is dilated from the use of atropine or any other cause, there is always some degree of discomfort in the light, so that the patient can only open his eyes (if at all) in the shade. Other more uncommon diseases or natural conditions in the eye also cause day-blindness; and it occurs naturally, but only for a short time, when one passes suddenly from darkness into bright light.

The disease causing the symptoms should be treated. A central "blind spot" can be to some extent relieved by giving drugs which enlarge the pupil of the eye, or by making a new pupil. Inflamed eyes are relieved by a shade or by tinted glasses, until the disease which caused the condition has cleared up.

DEAD FINGERS.—There are people who suffer from what is popularly called dead fingers. The fingers, and sometimes the toes, may suddenly go white and cold and remain so for a short period and then just as suddenly regain their normal colour. The disease is considered to be due to a disturbance of the nervous system. Particulars are given under its medical term RAYNAUD'S DISEASE.

DEADLY NIGHT-SHADE.—*See* ATROPINE and BELLADONNA.

DEAF-MUTISM.—This means that a person can neither hear nor speak. It may date from birth or be acquired at an early age, and in nearly every case the deaf-mutism exists because the child cannot hear and so has never learned to speak, as speech comes from the imitation of sounds heard. The most usual cause of deaf-mutism dating from birth (*congenital deaf-mutism*) is a defect in the development of the internal ear; this may be hereditary and is said to be comparatively common in children who are the result of marriages between near blood relations, such as first cousins. Deaf-mutism acquired at an early age may be due to a variety of diseases, such as meningitis, scarlet fever, mumps, and inflammation of the internal ear.

Treatment.—The first thing to do in the treatment of deaf-mutism is to make sure that the condition is not due to some disease of the ear, which ought to be treated. If the deaf-mutism is due to a defect of development of the ear no treatment will be of any avail, and the child should be sent to a special school for deaf-mutes, of which there are a number in different parts of the country, such as Manchester, Edinburgh, and several schools under the London County Council. Teaching speech by signs is now out of date, as it restricts conversation to those who are acquainted with the deaf and dumb alphabet. Nowadays deaf-mutes are taught by lip-reading and by the sense of touch: the pupil watches the movements of the teacher's lips and at the same time places his hand over the teacher's throat to feel the movements of the larynx. Although the education of deaf-mutes is a long and tedious business, the results usually obtained make it well worth while. (*See also* DEAFNESS.)

DEAFNESS.—This may be due to blocking of the outer passage (external meatus) of the ear by wax, to blocking of the middle ear (the little space behind the drum) by catarrh or inflammation, or to disease of the internal ear (nerve-deafness). Many persons, when they become deaf, say that there is deafness in their family, and make little effort to get cured; but an extremely small percentage of cases of deafness is due to any family influence. Deafness is common, much more common than most people imagine, and it is much more easily treated in its early stages than in its late stages, when it is almost always incurable. Wax can be removed easily by syringing the ear with a solution of bicarbonate of soda in warm water; this dissolves the wax, which the stream of water washes out. Catarrh of the middle ear is usually an extension of a cold in the nose up the little tube that leads to the ear to the middle ear itself. It is often brought on by violent blowing of the nose when one has a cold or by using a nasal douche and sniffing it up the nose too hard. Catarrh of the middle ear is best treated by inhalations of menthol or Friar's balsam (1 teaspoonful to a pint of boiling water); a specialist can clear the ear by blowing the catarrh away with a little silver eustachian catheter; but this is a difficult procedure that needs much practice. Inflammation of the ear and chronic discharge from the ear cause deafness, but require treatment by a doctor to get them well. Internal ear-deafness (nerve-deafness) is usually due either to old age, or to a poisoning of the nerve of hearing by tobacco or quinine, or by the poisons of such diseases as mumps or syphilis. It takes a lot of strong tobacco to cause internal ear-deafness, but this cause is not uncommon. This last type of deafness is the most difficult to cure, and the cause must be found and treated.

Artificial Aids to Hearing.—Many people rush to use an artificial aid to hearing without due consideration. No artificial aid can bring back the hearing to normal, for the reason that the aid itself is bound to have a restricted range of hearing. People prefer electrical types, because they are inconspicuous. These are often useful in middle-ear deafness (especially the kind called otosclerosis), when the deaf person cannot hear another person speaking unless he raises his voice. An ordinary hearing-trumpet (a useful one is the "banjo" type) does not need new batteries or renewals, but has the disadvantage of being more conspicuous; except for this disadvantage, the hearing-trumpet is often the best type of hearing aid. No artificial aid is of any use in internal ear deafness (nerve-deafness); but the ears should always be examined by an ear specialist before getting an artificial aid, so as to get a correct diagnosis of the type of deafness. One has known a person to buy an expensive electrical artificial aid to hearing when all that was the matter was merely a plug of wax in the ear.

DEATH.—Death is represented in art by a skeleton with scythe and hour-glass, or as a reaper, cutting down bearded grain and innocent flower alike. But however he is painted or written about, we cannot escape him; and death, in one form or another, is familiar to most of us before we have gone far on life's journey. The child sees its kittens or rabbits die; it watches the autumn leaves flutter to the ground, brown and apparently lifeless; perhaps someone in the family dies. Indeed there is nothing, says Shakespeare, that we can call our own but death.

There are ten thousand doors, says another English poet, Webster, that may open "for man to take his exit." Death, that is to say, may be natural, owing to the natural decay of old age; or it may be violent, as by drowning, a street accident, a snake-bite; or it may be the result of a lingering disease; and under each of these headings there are many forms it can take. So that while there may be many months, even years, in which to face the great change ahead, on the other hand there may be nothing but the instant "between the saddle and the ground" or between the capsizing of the boat and the last going down when, according to a popular notion, our whole life passes before us in a flash.

In a sense, we begin to die as soon as we are born. Our bodies are built up of millions of tiny cells; this is called tissue. Each time we exert ourselves, whether bodily or mentally, as in walking, scrubbing a floor, talking, or merely thinking, we use up some of this tissue, and it is destroyed and replaced by fresh matter. This is going on all our lives, so that we are continually dying and continually being reborn until the moment of death comes.

How do we Recognize Death?—When death takes place two things occur: (1) the circulation of the blood through the body, and (2) the act of breathing, stop. Changes take place in the cell tissue and, consequently, in the appearance of the dead person.

That the circulation has really stopped may be ascertained by listening carefully for the heart-beats. For the breathing, a looking-glass may be held before the face and note taken whether it becomes misty, or a feather may be placed on the upper lip and we may watch carefully for the faintest fluttering.

Those in attendance should close the eyes and mouth, bandage the jaw and straighten the limbs.

A few hours after death the body is cold. Bruise-like marks on the back show that congestion of blood is taking place; during the next few hours the muscles stiffen, to relax again in about four days. A greenness on the abdomen two or three days after death shows that decay has begun.

Duties of Relatives.—It is the duty of the relatives personally to report the death to the local registrar of births, marriages and deaths; if a doctor was in attendance during the last illness, written notice must be accompanied by the doctor's certificate of the cause of death. They must sign the register in the presence of the registrar. Failing any relative who was with the dead person when death took place, or attending on him, the duty of informing the registrar falls on some other relative. Failing any relatives, it falls on someone present at the death, then on the occupier of the house, then on someone living in it, or the person arranging for the funeral. The body must not be buried until the registrar has given a certificate; this is handed to the clergyman at the funeral.

Sudden or violent deaths and deaths in prison are matters for the coroner. It would be the duty of anyone witnessing a sudden or violent death or finding a dead body to inform the police. In Scotland the Procurator Fiscal holds a private inquiry and the Lord Advocate may order a public inquiry.

Cremation.—Anyone wishing his body to be cremated after death should leave written instructions to this effect. If he forbids this form of burial, it cannot take place. Regulations for cremation and disposal of the ashes are made, under Act of Parliament, by the Home Secretary, and certificates by two doctors are required before cremation can be carried out.

DEATH AGONY.—When death is about to approach a person there may be convulsive movements of the muscles which appear to cause great agony, but it is doubtful whether this is the case as the patient is usually unconscious and the muscular movements are produced by asphyxia. Many people are familiar with the way a chicken twitches after it is supposed to be dead; these movements are similar to what is termed the death agony in human beings.

DEATH-RATE.—As, in death itself, the two great events are the stoppage of the circulatory system and the stoppage of the breathing, so in the figures showing the death-rate over the country year by year and quarter by quarter it is the diseases of these two that stand at the head of the list of causes of death. First the heart and circulatory system, then bronchitis, pneumonia and other diseases of our breathing apparatus. So it is the stoppage of these two essential things, things that work automatically, as it were, all our lives, without calling attention to themselves so long as they are healthy, that accounts for most of the deaths taking place.

Third in the list of causes of death comes that dreaded disease, cancer. Every now and then we realize, from what we read in the newspapers, that scientists are at work on research into the cause of cancer. Meanwhile it destroys many lives, often after long and painful illness. Nowadays, people are less nervous than they were of going to see the doctor if they are worried about a lump, or have any other symptom that brings to their minds the fear of this disease. They know that the dread disease is curable so long as it is recognized early enough.

Next in the list of causes of death come diseases of the nervous system, and then come all forms of tuberculosis—consumption, or tuberculosis of the lungs, being the chief.

The above are the main causes; but there are others that make us think. For instance, there are still far too many deaths of mothers either in childbirth or as a result of it. Research into the causes of this loss of life is being organized, and it is to be hoped that the reasons will be recognized soon and the number of deaths greatly diminished. On the other hand, the growth of welfare work among mothers and infants is certainly bearing fruit, for there is a most encouraging fall in the death-rate of infants and children—"amazing," the Registrar calls it in his latest report.

There are far too many street accidents. Here are some interesting figures. In the United Kingdom in 1918—the last year of the Great War—there were two thousand fatal street accidents. In 1930 there were over six thousand. There were not quite so many last year, but the number is still far too great for a modern civilized community.

How do we get these figures?—All deaths, and their causes, have to be reported to the local registrars of births, marriages and deaths. They send up their returns to the Registrar-General at Somerset House, London, and he issues reports periodically, giving the principal total figures. The last report for England and Wales estimated the death-rate at slightly over eleven for each thousand of the population.

DEBILITY.—Debility is a term used to describe a state of health which is very much below normal. The term is a very wide one and many people use it when there is any form of weakness present in the system. Debility may be used to describe a state of the part of the body which is most affected; for example, there is a state of *general* debility which may be caused by insufficient or improper food, lack of exercise, unhealthy surroundings, or many other causes such as exhausting illnesses or poisoning. *Nervous* debility usually owes its origin to some nervous worry which the patient has had for a long time. Financial or business worries or love affairs which have not turned out satisfactorily will often cause nervous debility. *Cardiac* debility is a term applied to persons who are suffering from some weakness of the heart. It does not mean that the heart is diseased, but it may be in a temporarily weakened state as a result of a severe illness. Any form of debility should be treated with adequate rest, plenty of fresh air, good and nourishing food and a proper amount of exercise and tonics.

DECLINE.—When this term is used it generally means that the patient is gradually losing strength and that the body is wasting away. The word is popularly used in connection with consumption, but "decline" may occur in many other wasting diseases such as nephritis, nervous debility or in certain infections of the lungs.

The most striking symptom of decline is the continued loss of flesh. This may be very rapid and is very noticeable in fat people. Some patients have been known to lose as much as ten pounds in one week. The patient usually appears grey and dull, and the skin loses its elasticity. The hair becomes lank and may even turn prematurely grey, and the eyes generally have an expression of utter hopelessness. Any slight exertion seems to cause extreme fatigue and the patient seems

incapable of any mental concentration. There is usually no pain present in a condition of decline, but the patient may complain of chilliness and stiffness.

Treatment.—The treatment of this condition must vary on account of the different causes of the complaint. Rest is necessary to those patients who are suffering from decline owing to some disease, but if the decline is brought on by mental suffering, the patient should be made to take a certain amount of exercise. Very often a complete change of surroundings, especially to some cheerful place with the right companionship, will do much to improve the mental outlook of the patient. Young women, perhaps not so much nowadays as in the Victorian period, were very apt to go into a state of decline because of an unhappy love affair. In cases like this, a change of surroundings is of the utmost importance, otherwise the patient may be inclined to brood and the state of decline may become very serious. Great emotional disturbances have a very marked effect on some of our glands and organs, especially in patients who are at all sensitive or highly strung.

DECOCTION.—This word is derived from the Latin, which means to boil down. In dealing with medicine, a decoction is made by boiling a drug or drugs for a certain length of time and afterwards adding water if necessary. There is a difference between a decoction and an infusion. A decoction is actually boiled; but an infusion is made by pouring boiling water over a substance just as in making tea. In the British Pharmacopœia there are decoctions mentioned such as acacia bark which is used as a gargle for relaxed throats, and sappan which is used to make red ink. Decoctions may also be made from poppy heads, camomile, quince seeds, Irish moss and compound sarsaparilla.

DECOMPOSITION.—In science decomposition means the splitting up of chemical compounds into their elements. This chemical change is taking place all the time in our bodies; in fact, it is a necessary part of the body's normal workings. It is only when we suffer from disease that these normal workings interfere with the proper rate of decomposition and therefore prevent the growth of healthy tissue.

Decomposition of foodstuffs is a very important point in regard to the health of the human being. Decomposition takes place owing to the presence of germs which produce poisons of great activity. Ptomaine poisoning is due to the presence of germs in food and in some cases death has occurred after eating such food. Age alone is not responsible for decomposition, because if food is kept under proper conditions it will not decompose as rapidly as food which is exposed to the action of germs. Food when properly tinned may keep for years, also meat if it has been kept in a refrigerator where bacteria could not exist. All decomposed food should be avoided, and care should be taken to prevent unnecessary decomposition taking place by storing the food in a cool, dry place and providing suitable covering to keep out dust and flies which carry germs.

DEFECTIVE VISION.—There are two sorts of blindness and defective sight: in the first there is an easily recognizable defect in the eye; in the second, however, there is no obvious cause in any part of the eye. It has been happily described as a "disease in which the patient sees nothing and the physician sees nothing!" The term *amblyopia* is used to mean this latter form of defective sight.

Amblyopia due to defective development is frequently found along with other defects of the eye. The most common is long sight (hypermetropia), where one eye is affected, and the other is nearly normal. In these cases squint frequently occurs. The child's habit of using the "good" eye and resting the squinting one undoubtedly aggravates the condition; but it is of no use, as was formerly done, to occlude the good eye with a ground glass lens so as to make the squinting eye do its proper work. The power is lost as soon as the good eye is allowed to resume its rôle of fixation.

The treatment of this form of amblyopia should be on preventive lines as far as possible: if a child is noticed to use one eye more than the other, for instance, or if there is any other peculiarity in his sight, he should be treated as soon as possible by an oculist. If this is not the case, some amblyopia must result, even if the adverse conditions are removed later in life.

In lead poisoning, various retinal *changes are met with*, with *corresponding* symptoms. The prognosis in these cases is very bad.

Further deterioration of vision, with changes in the optic nerve, are sure to follow, even when the source of poisoning has been removed.

When in the course of retinitis due to Bright's disease, the patient suddenly becomes worse, the cause is not in the retina itself, but is due to uræmia. This will partially clear up if the uræmia can be treated successfully.

In functional amblyopia, sometimes called amblyopia fugax, from its *transitory* character, the loss of sight may be complete or partial. It comes on in the course of a few minutes, and may last from half a minute to an hour. It is sometimes preceded by "flashes of light before the eyes," and may be followed by an attack of migraine. It may occur quite frequently; no changes are seen in the eyes. There is another similar form in which, however, the attacks are longer, and œdema (or swelling) of the retina will be found. This is due to spasm of the retinal arteries. The attacks are infrequent, and unless very severe, no permanent harm is done. (*See also* AMBLYOPIA; BLINDNESS; VISION.)

DEFICIENCY DISEASES.—Are a group of diseases due to the lack of an essential element in the food called a vitamin; vitamins A, B and C are different varieties of vitamin, the lack of which causes different diseases. The first disease that was recognized to be due to vitamin deficiency was scurvy, which is caused by lack of vitamin C, which is present in fresh vegetables or meat. Scurvy formerly used to break out on ships in long voyages, and it was found that it could be prevented by taking daily a small amount of lime juice as it was called. (In reality it was lemon juice from Mediterranean lemons, which were called limes by mistake; lemon juice, it has been found, contains much more vitamin C than does lime juice.) Vitamin B, when lacking, causes a disease known in the East as beri-beri, in which the affected person has severe neuritis and eventually various forms of paralysis. At the siege of Kut, during the Great War, it was observed that the soldiers who had hand-milled (unpolished) rice escaped beri-beri, but those who fed on white (polished) rice contracted it; the reason for this was that the "germ" of the wheat contains something that prevents beri-beri. Rickets, the third deficiency disease to be recognized, is due to an absence of vitamin A, the existence of which was made known only after vitamins B and C were discovered. It has been found that rickets can be prevented by sunlight and by taking animal fats. In this country an ordinary good mixed dietary is the best preventive of vitamin deficiency, as such a dietary will normally contain enough of the various vitamins to prevent any of the deficiency diseases developing. (*See also* SUPPLEMENT ON DIET AND INVALID COOKERY.)

DEFORMITY.—Any abnormal condition of the body whether congenital (present at birth) or acquired later in life may be termed a deformity. Deformity may arise from many causes. When present at birth, it may be due to faulty development of the child in the womb; it may be the result of some injury to the body at birth; or it may be caused by disease.

Certain deformities such as extra toes or fingers seem to run in families, but such deformities are very easily got rid of if attended to at birth and no discomfort or unhappiness is caused when the child grows up. Those which are most common are club-foot, dislocation of the hip, cleft palate, hare-lip and wry-neck. Other congenital deformities may not be so easily treated and may even be so bad as to prevent a normal life being led.

Deformities due to injuries are very extensive indeed and may include scarring of the skin and shortening of the muscles, and damage to the bones. Many people are so badly scarred by burns that the tissues are destroyed, leaving very disfiguring marks. Skin-grafting has done much to prevent ugly deformities, especially on the face; this is carried out by taking skin from a healthy part of the body and causing it to grow over the disfigured parts. When muscles have been damaged they usually shorten during the process of healing. This condition may be treated by massage; but, as a rule, a surgical operation is required to put matters right. Broken bones always cause a certain amount of deformity and unless they are properly reset, a considerable amount of deformity will result. It is advisable to have X-ray photographs taken after a fracture has been reset in order to make sure that the bones are in the correct position.

Various diseases are responsible for causing deformities of the bones and by far the

most common is tuberculosis. It attacks the growing bones of young children and may even destroy part of the bone; the ligaments also become diseased, thus causing the bones to assume abnormal positions. Most of the cases of humpback are due to tuberculosis of the spine and many displaced hips are due to the same cause.

Rheumatoid arthritis is a disease which affects many of the joints in the body. Very serious deformities are caused by this inflammatory condition and many people become altogether bed-ridden by it. However, the chief general disease which leads to deformity is rickets. This condition causes the bones to become soft and, as soon as any pressure is put on them—for instance, when the child begins to walk—the bones become distorted and many serious deformities are thus produced. Humpback, curvature of the spine, bow-legs, knock-knee and deformity of the pelvis are a few of the conditions which may arise through rickets. Many women are prevented from having children or, at least, have a difficult and dangerous time at childbirth because of the damage done to the pelvis by rickets in early childhood.

Paralysis due to some nervous condition may cause serious shortening of the muscles. Infantile paralysis, especially, is the cause of many permanent deformities. The limbs gradually waste away through not being moved or used, and a withered arm or leg is often one of the results of this condition. Surgeons who deal with cases of deformity are known as *orthopædic* surgeons, and surgeons who build up parts of the face or body are known as *plastic* surgeons. During the Great War, when terrible injuries were inflicted and very often parts of the face were blown away or destroyed the plastic surgeon was able to work wonders by building-up and repairing the features. It was no uncommon thing for a man to have a new nose built on to his face, or for a great gap in the jaw to be filled in so that the face presented a normal appearance. This type of work has now become very advanced and there is no longer any need for people to lead unhappy lives owing to ugly facial disfigurements or deformities.

DEGENERACY.—As has been said before, the word "degeneracy" is used to apply to certain types of people who are obviously marked out from birth to behave in an abnormal fashion. These are such people as the insane, habitual criminals and incurable drunkards. These people are called degenerates and it is obvious that there must be some deterioration in their mental and moral machinery which makes it impossible for them to behave otherwise than they do. Some authorities in the past have tried to prove that these moral degenerates have definite physical abnormalities, such as crooked ears, bent-over thumbs, curiously shaped heads, etc., by which they can be recognized; but there is no truth in this theory. Everybody knows perfectly normal and trustworthy people who look like criminals, while the most degenerate criminal or insane person may be physically beautiful.

Degeneracy appears to run in certain families, which means that the stock is bad, and unless new blood is introduced the members of that family will go on being degenerates until the family finally dies out. This factor plays a very important part in animal breeding, and farmers are always on the lookout to detect any sign of degeneracy in the flocks and herds.

DEGENERATION.—By degeneration is meant a gradual change for the worse in the working of our bodies. It may be the natural process of growing old, when all our organs are wearing out and the stocks of energy of one sort or another that keep our bodies in working order are getting less; or it may be due to causes that are not inevitable, such as illness or poisoning of the tissues by substances which are taken into the body from without or are manufactured in the body itself. Degeneracy, on the other hand, is a word used in the medical sense to mean that a person has been born with the workings seriously below normal. It is very often applied to the mind, and a person who is below par mentally is referred to as a "degenerate."

With regard to the degeneration of old age everyone knows that they cannot expect to be as strong and stand as much strain in their old age as in their youth and prime. In a machine which is made up of many parts, it is to be expected that one part after another will wear thin or wear out entirely; for the machine we can go out and buy another part to replace the worn one and the machine becomes as good as new; but in the machinery of our bodies, a part once worn out cannot be

replaced. We cannot buy ourselves a new stomach or a new pair of kidneys or eyes; all that we can do is to take as good care as possible of our machinery while it is in good working order, and when it is wearing thin, treat it with as much consideration as possible and make it last as long as possible. After all, man's allotted span of life according to the Bible should be three score years and ten—seventy years. The "old age pension" is given at the age of sixty-five. The normal healthy person should expect to be doing and enjoying a full day's work until at least sixty years of age, then the time arrives when notice must be taken of the decay and downhill trend of our bodies and mental faculties. The nervous system is not what it was, various glands do not function as well as formerly, the heart is not so strong as it once was. The blood pressure is too high or too low, the arteries are hardening. In fact, the degeneration of old age is setting in, the machine is showing signs of age, and the time has come to slacken off.

It happens very often, unfortunately, that these signs of degeneration are observed not at the time of normal old age, but when most people think they are only approaching middle-age, round about forty or fifty. The degeneration in this case is due to the poisoning of the tissues from various causes that usually might have been prevented if proper care of the body had been taken in the journey through life, chronic constipation, a habit of worrying and overworking, over indulgence in alcohol or smoking, or just habitual over-eating and under-exercising. The early degeneration due to definite diseases, such as Bright's disease, pernicious anæmia, etc., is not dealt with here, since it is obvious that the sufferer from a chronic disease must take special measures to keep himself going if he is to reach old age at all. But, apart from disease, far too many people carelessly allow themselves to start on the downward journey at far too early an age. The man who becomes plump from self-indulgence in his thirties will have a sixty-year old body when he is fifty, unless he mends his ways, and the business girl who smokes twenty cigarettes a day will be a "nervous wreck" when she reaches the difficult years of middle age. Probably her grandchildren will not "rise up and call her blessed," but will keep out of the way of her nagging tongue. This is an artificial degeneration. The machine has been badly used and will not, of course, last as long and as well as the machine which has been well treated and properly cared for.

DELHI BOIL.—This is one of the many names applied to an Oriental sore. The condition is described under the heading ALEPPO BUTTON.

DELIRIUM.—This is a mental disturbance which is marked by excitement, bodily restlessness and flights of the imagination and accompanied by senseless chattering. Delirium occurs in many disorders, but is a particularly distressing accompaniment of any high fever. To the onlooker it is a terrifying thing to hear a relative talking utter nonsense, or "wandering" as it is often called, and to see him or her tossing about from side to side in a vain endeavour to obtain rest. Fortunately, this disturbance lasts for a comparatively short time. In most fevers like scarlet fever, or diphtheria, or in pneumonia, delirium does not necessarily mean that the patient is very gravely ill; it is only the height of the fever which is causing the delirium. But in certain diseases it is a very bad sign if the patient develops delirium. Typhoid fever is one of these diseases. In this disorder, the delirium is rather different in type; instead of being noisy and restless the patient sinks down into bed and mutters nonsense.

Delirium is one of the features of the attack in that form of insanity known as acute confusional insanity, which very often is associated with such physical conditions as poisoning by alcohol, belladonna, food poisoning; or which occurs in some cases after childbirth or after severe hæmorrhages. Acute confusional insanity is a very favourable type of mental disorder, and happily, the patients, on recovery, nearly all forget their illness and have little or no recollection of anything that happened during their sad experience. In the attack, the signs of delirium are all present, but they are all exaggerated. The patients are lost in time and space, and do not recognize those about them. They are noisy and restless; they may roll about the floor and it is consequently difficult to keep them in bed. Hallucinations may be, and are, nearly always present. That is to say, the patient may hear voices, see visions or smell odours, which are not, in fact, in existence. In

some cases, rather quaint visions are seen; the patient describes small brightly-dressed people, one to two inches in height, who amuse and interest him by their antics. More often the visions are unpleasant, weird animals, or devils, are seen. According to the degree of restlessness and confusion, it is for the medical practitioner to decide whether a patient who has the delirium of acute confusional insanity should be nursed at home, or temporarily be removed to an institution. It is comforting to know that when the latter alternative is decided on, the period of residence is likely to be short and recovery from the attack almost certain.

DELIRIUM TREMENS.—This is not the result of a very large single dose of alcohol; it occurs in those people who are steady drinkers, never drunk, but never completely sober. It comes on very often if, owing to such unforeseen circumstances as an injury, or attack of pneumonia, all alcohol is suddenly stopped. Delirium tremens is really a variety of acute insanity which is marked by delirium with trembling and excitement, and in which there is great anxiety, mental distress, sweating and pain. It lasts only a few days and with proper treatment, recovery is the rule; but any further indulgence in alcohol renders the patient liable to another, and probably a fatal attack. The mental signs of an attack are mainly those of confusion and anxiety or states of intense terror. Terrifying visions, well described by many novelists, are seen. These visions commonly take the forms of animals crawling over the bed and up the walls, or of terrible enemies who threaten the patient with immediate death. Restlessness may be extreme, the patient throwing himself all over the room in an attempt to escape from his horrible visions and, it is not surprising therefore, that he is completely unable to sleep. The patient looks, and is, physically ill; his face is an unnatural reddish colour, his breath is offensive and he cannot take food. There is a trembling of the limbs which may be limited to the arms or may also be seen in the legs. The temperature is often slightly raised.

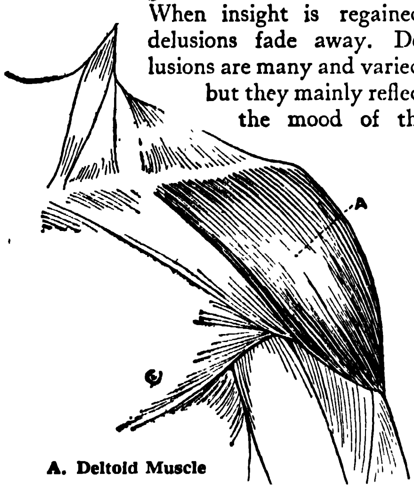
Treatment.—It is difficult to treat a patient in his own home, because he is likely to be very noisy and violent, and it may take two or three attendants to prevent his hurting himself. On the other hand, the disorder is likely to last only a few days, and the patient on recovery, though weak, is perfectly clear in his mind, and may resent having been moved. This problem has to be settled for each individual case according to circumstances. The great point about the treatment, wherever it is given, is to ensure that the patient obtains sufficient sleep, and this is one of the conditions in which the use of drugs to obtain the necessary sleep is absolutely essential. Next to sleep, sufficient food is the main requirement of a patient with delirium tremens, as it is notorious that alcoholics do not take enough food. In an attack of delirium tremens, milk is the best diet in the worst stages. Afterwards, the diet can be built up slowly. On recovery, the patient must be warned that for the rest of his life he must be a total abstainer. Unfortunately, this advice is rarely taken and either another attack of delirium tremens, or other results of chronic alcohol poisoning, such as cirrhosis of the liver, finish the patient's career.

DELIVERY.—By delivery is meant the stage of childbirth during which the child actually passes from the womb of the mother. In a normal delivery the head of the child comes first, and the rest of the body usually comes away within the space of a few seconds. After delivery has taken place, the mother should rest in bed for at least a fortnight; but if this is not possible, daily rests should be taken and all heavy work should be avoided. Falling of the womb and its complications very often occur because the mother has neglected to take sufficient rest after her child has been delivered. (*See also* CHILDBIRTH; LABOUR.)

DELTOID.—This is the name given to a thick muscle of the shoulder. It derives its name from its likeness to the Greek letter delta Δ.

DELUSIONS are false beliefs or judgments which cannot be accepted by persons of the same race, class, age and education as the person who expresses them. This rather lengthy definition of delusions is necessary, because what is a delusion for an intelligent Englishman might well be accepted as a natural belief for a savage in the wilds of Africa, or for a child of five years old. For example, if such a child drapes a tablecloth round his shoulders, puts his father's hat on his head and proclaims himself a king, we are amused, and say that he has a vivid

imagination. The same conduct in an educated man would result in measures being rapidly taken to secure his detention as a person of unsound mind. The most important feature of any delusion is the intense conviction with which the deluded person persists in his belief or judgment. No amount of argument, or what a normal person would call "proof to the contrary" will shake an insane delusion, and time so spent is only wasted. So long as a delusion lasts that person is definitely insane, inasmuch as he has lost insight into his true condition. When insight is regained, delusions fade away. Delusions are many and varied, but they mainly reflect the mood of the patient. A depressed patient has delusions of misery and woe; he has committed unpardonable crimes; brought ruin on his family; his brain is rotten; or his limbs are made of glass and will break if he moves them. An excited patient tends to have delusions that express his sense of well-being; he possesses vast estates, can break every athletic record, and go for a fortnight without sleep. Some patients have what are called systematized delusions, because not only are these delusions supported by argument, but they govern the patient's conduct. It is in patients with systematized delusions that we find cunning, but insane, criminals. A patient with such a delusion hears voices, for example; these voices tell him that certain people are plotting against his life; in order to save his own life it is necessary that these other people should be killed—and so Broadmoor receives yet another inmate. It must always be remembered that a delusion, though not necessarily governing conduct, is a sign of grave mental disorder. In every other respect a patient may appear perfectly well and mentally normal; but if he is the victim of a delusion, careful watching is essential lest the delusion should influence his conduct and place the patient within reach of the law.



A. Deltoid Muscle

DEMENTIA.—This is a permanent loss of mind which results from destruction of certain nerve cells in the brain. It must be distinguished from *amentia*, a condition in which the mental powers have never developed. Dementia may be the last stage in some other mental disorder, or it may occur as the result of the wearing out and breaking down of the nervous system in old age, or the specialized cells of the nervous system may be starved of blood through disease of the arteries of the brain and so perish. The chief causes of disease of the brain arteries are excessive consumption of alcohol, chronic disease of the kidneys and syphilis.

Dementia Præcox is a mental disorder which causes, in its late stages, the most profound dementia. This mental disorder begins as a rule in adolescence or early adult life, and mostly in persons who have a family history of established mental disease. Before the onset of dementia præcox, the patient nearly always shows some signs of mental peculiarity. Such a young person is unduly shy, very serious-minded, inclined to "withdraw into himself" and has unnaturally high ideals which he cannot share with his companions. Ambition is totally lacking. When the disease shows itself, all these characteristics become exaggerated. The dementia præcox patient "withdraws from the world." He is solitary. will not converse with anyone and hides himself away in corners. Obvious indifference to those whom they have formerly loved is a very striking feature of the condition. Gradually less and less interest is taken in their surroundings, and the final picture is that of a complete "human vegetable" who will allow himself to be fed and kept clean, though often he will refuse food and struggle against being fed. This kind of "cussedness," when the patient does the exact opposite of what is required of him, is known as negativism, and is peculiar to this condition of dementia præcox. Life is long in these patients, mainly because they are well taken care of. There is no hope of a real cure: but in certain,

and unfortunately, few cases, it is possible to train these patients to look after themselves and to do the simplest domestic tasks.

Senile Dementia is that condition of old age in which the mind gives way before the body. The memory fails and the patient lives in the past. He becomes irritable and hard to please, and laughs and cries more easily than would be expected of an adult. He often loses things, owing to forgetting where he has put them and then accuses others of stealing them. If not treated tactfully and sympathetically such people often develop ideas of persecution or imagine that their relatives wish to rob them. Finally, there is the "second childhood" in which everything has to be done for them as they are incapable of even feeding themselves. Only kindly and tactful attention can make the last few years of these unfortunate folk anything but a burden to them.

DEMULCENT.—A demulcent is the name given to any substance which has a soothing effect on the skin, particularly on raw surfaces such as a sore throat. In cases of poisoning, white of egg acts as a demulcent on the linings of the stomach; and any soothing ointment is a demulcent to the skin.

DENGUE FEVER.—This is a type of fever which is very common in most tropical countries, and which usually commences with great suddenness. It is a disease which is practically never fatal and it must not be mistaken for other conditions, such as measles, malaria or influenza.

Symptoms.—As a rule a feeling of chilliness and rheumatic pains in the joints may be felt a little time before the fever actually begins. As the temperature rises, there is severe headache and aching pain at the back of the eyeballs. The joints, all over the body seem to ache with rheumatism, and the pain is more severe on movement. The face appears to be puffed up and bloated, and the skin of the whole body is dry and flushed. The tongue is at first moist and furred, but soon becomes dry and coated, and the throat may be sore. Vomiting is not uncommon, and there may be diarrhœa, though oftener there is constipation. In severe cases the temperature may rise as high as 104° and delirium is not unusual. The crisis occurs about the third day, accompanied by sweating and diarrhœa. The headache is relieved and the temperature may fall, and what is known as "the stage of calm" is reached. At this time the patient may feel extremely weak, but be well enough to get up for a short period.

On the fourth day, or sometimes as late as the seventh, from the date the illness began, the rheumatic pains return, the temperature rises slightly, and a rash resembling scarlet fever or measles appears. The rash begins on the hands and the backs of the wrists, and spreads to the arms, body and legs. In the meantime the temperature returns to normal and the spots may take two or three weeks to finally clear up. The rheumatic pains may be felt for a little time after the fever has disappeared and the patient may suffer from sleeplessness. Appendicitis has been known to occur as a complication of dengue fever.

Treatment.—The patient should be kept in bed until the rash has disappeared. Aspirin, in doses of ten grain every six hours, may be given in order to relieve the rheumatic pains. Doses of health salts should be given as soon as the fever begins. The convalescent period is straightforward and rapid, but there may be a persistent feeling of weakness for a long time after. A change of climate is usually necessary for Europeans if this weakness does not wear off.

DENTAL DRILL.—Like everything else, there is a right and a wrong way of cleaning teeth. To begin with, the proper tooth-brush must be used and the best kind are made with bristles which are not too soft and which do not come out with use. Some people, it is true, have very tender and soft gums and the slightest rubbing may cause bleeding, and for them a softer brush will be best; but for the average person, a medium-hard brush will be found suitable. There are so many forms of tooth-brushes to be had that it should not be a difficult matter to choose a brush to suit the individual taste.

The choice of dentifrice is also a matter of individual taste, and any which is made by a reliable firm is sure to give satisfaction. Some people cannot use those which are made up in the form of a soap, as the foamy lather in the mouth causes them to feel nauseated. Carbolic powder makes a very excellent dentifrice for those who like to use a powder. Most dental pastes are very pleasant to use, and as a rule they contain an antiseptic substance which leaves the mouth

fresh and clean. A gritty tooth paste or powder should never be used for more than an occasional clean-up.

How to use a Tooth-brush.—The whole point of cleaning the teeth is not merely to polish the outer surfaces, but to clean between and behind the teeth as much as possible. In order to do this the brush should *not be drawn across the teeth but an up-and-down movement should be used.* This enables the bristles of the brush to work themselves into the spaces between the teeth, and in this way any particles of food can be removed. The dentifrice should be applied to a dry brush, and each side of the mouth, behind as well as in front of the teeth, should be brushed for a few minutes. After the dentifrice has been worked well into the teeth the mouth should be rinsed out with water. If an additional antiseptic rinse is desired, a few drops of hydrogen peroxide, or some other antiseptic mouth wash may be added to the water.

After the teeth have been thoroughly brushed, the tooth-brush should be rinsed under the tap and *dried.* This is an important point, otherwise the brush will soon become soft and the bristles will tend to break off or come out. It is better to hang the tooth-brush up on a rack, or small nail for the purpose, as this allows it to drain properly. At least two tooth-brushes should be kept for the purpose of carrying out dental drill, as the practice of cleaning the teeth is called; this ensures the use of a dry brush night and morning. In most books on dentistry it is advised to clean the teeth after every meal, but for the average person who is busy and away from home most of the day this is not practical, and a brush night and morning should be sufficient to keep the mouth clean.

Discoloured Teeth.—The colour of the teeth vary a great deal with different people, and it is not everyone's good fortune to be blessed with teeth like pearls, but much can be done to whiten them, especially if they become discoloured by too much smoking. A few drops of hydrogen peroxide sprinkled on the tooth-brush and used about twice a week will tend to remove yellow stains. Again, the hydrogen peroxide can be used as a mouth wash, but it should be kept in the mouth for a few minutes and not rinsed out, otherwise the cleansing effect will be largely lost.

Care of the Gums.—If the gums feel unduly tender and are inclined to bleed, a visit to the dentist may be indicated. If there are any signs of pyorrhœa, it will be necessary to have the matter attended to immediately. It is unwise to put off paying a visit to the dentist whenever there are signs of "pink tooth-brush" (as our American cousins call bleeding gums), because very often teeth which may later on have to be extracted could be saved by a little early attention.

To improve the health of the gums, and thereby improve the health of the teeth, the gums should be brushed at least once a day for a few minutes. Ordinary kitchen salt in half a glass of water is a very good thing to use for hardening the gums. The brush should be frequently dipped into the salt water and every square inch of the gums should be gone over. Friction is necessary to keep the gums healthy and it will also relieve chronic congestion and inflammation if present.

Artificial Teeth.—Artificial sets of teeth should never be left in the mouth at night, but should be placed in a tumbler of water to which some disinfectant has been added. Next morning they should be very thoroughly cleaned with a tooth-brush and powder or paste before being replaced in the mouth.

Dental Drill for Children.—Children after about the age of four are, as a rule, quite capable of starting to use a tooth-brush themselves. They should be given an attractively coloured one in order to encourage them to use it. In this way the habit of cleaning the teeth daily will be formed. Mothers should remember that a thorough brushing of the teeth at night, and certainly after the last meal is eaten, has more effect in preserving the teeth than brushing at any other time, but the morning brushing is also important. The effect of diet on the teeth is an important question which does not come into this article, but the eating of fresh firm fruits after a meal is an excellent way of keeping the teeth clean. Giving a child an apple to chew after a meal is just as good as sending him to clean his teeth, and the exercise necessary to chew the apple will help to strengthen the jaws and teeth.

For information on cause of dental decay *see also* TEETH, and similar matters.

Dental Floss.—This is used for cleaning between the teeth and for dislodging matter which may be clinging to the surfaces and necks of the teeth. The floss consists of strands of silk or similar material suitable for being drawn or slipped between the teeth.

Dentifrice.—Any substance used for cleaning the teeth is termed a dentifrice. There are many preparations to be had in liquid paste or powder form.

A tooth powder should not be too gritty or the continual rubbing may cause the enamel on the teeth to become chipped. Each person should use a dentifrice suitable to the individual needs. For example, if the mouth is acid causing tartar to form behind the teeth, an alkaline dentifrice containing magnesia should be used to neutralize the acid. Most preparations contain an antiseptic in some form or another, and the flavouring substances used are generally agreeable to the taste.

Dentine.—The hard substance which forms the greater part of a tooth is known as dentine. It resembles bone, but it is made up of different structures which vary somewhat in different teeth. Ivory, which is got from elephants' tusks, is an example of dentine. (*See also* TEETH.)

DEODORANT.—This name is given to any substance that deodorizes or destroys offensive smells. It is important when dealing with this matter to remember that the mere fact of covering up a smell is not removing the cause of it. Many deodorant substances also act as disinfectants; carbolic acid, for instance, is a powerful disinfectant, but it is only mildly deodorant and will not be of much use in covering up a very foul smell. On the other hand, chloride of lime is capable of acting both as a strong deodorant and as a disinfectant.

There are many preparations on the market which are sold for personal use in order to do away with all offensive bodily odours. Perfumes are used by many people for this purpose, but their use should be limited to small quantities otherwise their use may become objectionable.

The habit of washing the whole body has really only become popular within the last fifty years or so; in fact, in the old days one was looked upon as a cleanly person if the hands were washed. Perfumes were made much use of in consequence, especially by ladies of the Court, and even the gentlemen of these days gracefully flicked a scented handkerchief under their noses, no doubt to act as a deodorant.

In the sick-room the air can be deodorized by burning a piece of thick brown paper. The paper will smoulder, thus giving off a pungent smoke which will mask any offensive smell in the room. The windows should be thrown open top and bottom to allow fresh air to come in. Buckets of water placed in a room will remove the smell of paint. (*See also* DISINFECTANT.)

DEPILATORY.—This is the name given to any drug or method by which hair is removed from the body. Many depilatories are composed of sulphide of barium, but the effect produced by the use of this substance is temporary and the hair will grow again in the course of a week or two. It is necessary to mix them with water to make them into a paste. The paste is spread over the part of the skin to be treated and left on for about five minutes, then scraped off with a very blunt knife.

Shaving is a method which is very popular, but this tends to coarsen the hair and increase its growth. Plucking the hair with small forceps is a method which has also become popular within the last year or two. The eyebrows especially, are trimmed in this way. It is, however, a painful process unless the skin is slightly deadened by an application of ether or some such substance. Rubbing the skin with pumice-stone is sometimes carried out in order to remove hair from the arms and legs.

All these methods only remove the hair for the time being, because in order to destroy the hair for ever, it is necessary to remove the root. Electrolysis is a method by which permanent removal of the root may be carried out. This is done by treating each hair separately with a fine needle through which an electric current is passed. It is a task which requires a very skilful operator as there is great danger of damaging the tissues of the skin and thereby causing disfigurement. Diathermy is another electrical method of removing hair which is claimed to be more satisfactory than electrolysis. For further information about this subject *see* article on SUPERFLUOUS HAIR in the BEAUTY CULTURE SUPPLEMENT.

DEPRESSANT.—This is the name given to a group of drugs which cause a depressing effect on various organs of the human body; in other words, these drugs act upon these organs either through the brain centre or through the nerve supply and cause them to stop working. For example, when chloroform is given, it depresses the brain and eventually causes the patient to become unconscious. Many drugs are given to depress the action of the heart, and the same rule applies to the drugs which act upon various other centres of the body.

DEPRESSION.—This is a mental state in which there is a feeling of ill-being and sadness, slow thinking and a general sense of inactivity. The outlook on life is gloomy, all movements are slow, the expression is dull. Everything becomes a burden, and work almost an impossibility. The patient who is suffering from depression feels worst in the early morning when the vitality is at its lowest. At this time he is usually overcome by a feeling of despair at the thought of having to face another day. Frequently these patients neither seek nor will take medical advice. They declare that "nothing can be done," "their case is hopeless." It is in such a frame of mind that suicide is attempted. In almost every case of depression this thought of suicide enters the patient's mind. He is so wretched that he feels he cannot go on. Very often there is little warning before the attempt is made; the patient conceals his misery and may even pretend to those around to be better. It is fortunate that this state of depression occurs in attacks, and provided that during these attacks the patient is watched and prevented from attempting to take his life, the outlook for recovery from any one attack is good; but other attacks may occur.

Treatment.—The bodily health must be well looked after both during and in between the attacks. Very often the discovery and treatment of a source of bad infection in the teeth, nose, tonsils and digestive organ, will shorten the attack and prevent others. During an attack of depression, however mild, it is wise to stop work, as mental stress and worry only make the condition worse. Complete mental rest, with very light exercise in the open air is the best treatment.

DERBYSHIRE NECK.—A swelling of the neck known as goitre has long been associated with Derbyshire; hence the term Derbyshire neck. This condition seems to occur more often in mountainous districts than in others. (*See also* GOITRE.)

DERCUM'S DISEASE.—*See* ADIPOSIS DOLOROSA.

DERMATITIS or INFLAMMATION OF THE SKIN.—When the skin is irritated in any way, whether from outside or inside, it behaves like all the other parts of the body in like circumstances: it makes a protest. To this is given the name dermatitis, or inflammation of the skin, or just skin trouble. The greater the amount of the irritation, and the more sensitive the skin, the more severe is the resulting inflammation.

The first stage is that of *erythema* or redness, due to the walls of the blood-vessels dilating or relaxing. The next is that the relaxed vessel walls allow fluid to be poured out into the tissues of the skin; this results in the cells of the horny or topmost layer of the skin, instead of being shed as invisible single cells when their work is done, sticking together and coming off as noticeable *scales*. If the amount of fluid is greater, it flows out between the cells on to the surface and dries there, forming what are called *crusts*.

If the fluid is poured out more rapidly than it can make its way to the surface, it makes little pools in the epidermis, or upper layer of the skin. These form tiny blisters, and are called *vesicles*. Larger blisters sometimes occur, which are called *blebs* or *bullæ*. In some cases the fluid produced is actually so great as to wash off the outer layer of the skin, leaving an inflamed red surface from which drops of fluid are continually seen oozing. This was formerly called weeping eczema, but is now better known as *moist* or *weeping dermatitis*.

In very chronic inflammation the whole skin layer and the tissues underneath become thicker and harder. This process is called *keratosis*.

In view of these different results which may be brought about by irritation of the skin, and remembering that one or another, or two or three together, may be seen at the same time, it is easy to understand the great variety of skin "pictures" that may be found, the difficulty of treating them, and the patience that must in many cases be exercised by both doctor and patient if a

good result is to be obtained. There is, at present, no one-day cure for dermatitis.

Sometimes dermatitis occurs in which one form of reaction is the chief, and it is convenient to recognize and treat this. It must always be remembered, however, that it is the *cause* of the dermatitis, that is of importance, not the *form* it takes.

Red Dermatitis or Erythematous.—This is generally found on the face, and may be produced by the sun, or by such irritants as poisonous plants. If it occurs where two surfaces rub together, as between the thighs, it is apt to become moist. It is treated by lotions containing such powders as zinc oxide or zinc carbonate, or by simple dusting powders. Liniment exsiccans, which is composed of tragacanth, glycerine, and water, is excellent for slight cases, and "black wash" or weak tar lotions in chronic cases. Ointments and other greasy applications are unsuitable.

Swollen Dermatitis or Œdematous.—This generally occurs along with some other variety. It is generally seen on the upper part of the arms, and the body, where small swollen areas, about the size of a sixpence, are seen. Sometimes crusts occur. It is treated in the same way as the erythematous variety. Sometimes great benefit is obtained from a good rubbing with soap spirit, followed by a warm bath.

Pimple Dermatitis or Papular.—This occurs in two forms. There may be pimples on the inner surfaces of the arms and the back of the neck, which are burning and very itchy, or there may be a chronic crop of pimples, generally on the limbs, which are due to a too great growth of the skin tissue. The surface of the pimples may be flattened or pointed, and pale pink to dark red; as there is always itching, many pimples may be scratched off and crusts of dried blood are seen on the top. This form of dermatitis so closely resembles the skin disease called lichen planus, that for a long time it was thought to be a variety of this disease and called lichen simplex; it may also be confused with prurigo, if the itching is unusually severe.

In the acute forms the treatment is by lead and tar lotion, or by dusting powder, and if this is done early, it may prevent the formation of vesicles. The chronic form is very difficult to treat. It is generally best to "make haste slowly," and use weak tar lotion or "black wash," which produces a slow but steady improvement. Zinc gelatin is useful in cases where there is much itching. The general health should be regulated, and the requisite tonic or other treatment given. Arsenic, however, should be avoided, as it simply changes a chronic into an acute case. Argyrol and other silver compounds, and salicylic acid or salol, in a paste, may be tried cautiously; at first only on a small area of skin.

Vesicular Dermatitis, of which the main sign is little blisters, is fairly common. It usually occurs on the face, or to a lesser degree on the hands, and is the result of exposure to some strong irritant, especially a plant of some poisonous kind. It develops very rapidly from the red to the pimply, and then to the blistering stage. The blisters break on the surface of the skin, and a mild case may end in this way. In a more severe case more and more blisters are formed, which burst on the surface and form crusts. These act as nurseries and breeding-grounds for germs, and so the fluid that is poured out becomes changed into pus or "matter." If the discharge becomes still more profuse, weeping dermatitis results. If the blood-vessels are much dilated, as sometimes happens, the affected parts are of a bright scarlet colour; this was formerly called red eczema.

It is treated by lotions or mildly antiseptic powders. The discharge and crusts should be removed from time to time by spreading the part with strips of lint or old washed linen soaked in oil, or by a starch poultice. As the condition improves, a paste may be used. This may be made of equal parts of magnesia and vaselin; or Lassar's paste, which is made of equal parts of zinc oxide, starch powder, lanolin and vaseline, may be preferred. In weeping dermatitis, an astringent or drying lotion, such as black wash, or lead or aluminium acetate in a weak solution, should be applied by placing strips of lint soaked in the lotion over the part. Sometimes in this, and the "red eczema" variety, the patient is much relieved by the use of ointments such as Hebra's, which is composed of equal parts of lead plaster and vaseline. This should be applied by spreading on lint and placing over the skin, then bandaging. It should be changed twice daily. If the hands are

affected, and the patient is carrying out treatment at home, the application of strips and bandage may be a matter of some difficulty. In these cases it is more convenient if he has several pairs of washable cotton gloves, a clean pair to be used each time the dressings are changed. If his "dresser" turns the gloves inside out, puts them on, and "washes" them all over with the ointment, then re-turns them for the patient, the dressing will be easily and satisfactorily performed. If liked, he can wear a second pair of gloves over the first. Sometimes it is necessary to try one or two ointments before one is found to suit the patient.

Blistering dermatitis may be taken as a good example of how to dress an inflamed skin. It will be noticed that the lotions, pastes, and so on are not applied directly to the skin by "dabbing" on, or rubbing in, but are first applied to lint, and this gently laid over the inflamed parts. The object in treatment is to assist the skin in its work of healing, not to rub off the tender new skin as soon as it forms.

Scaly Dermatitis is usually the last stage of the other varieties. It may occur on any part, but is especially noticeable on the legs.

The treatment is directed to soften and remove the scales. Ointment and pastes are therefore used, and very well rubbed in. Tar or salicylic acid, both of which help to dissolve the horny scales, may be added to the ointment in small proportions. Old people sometimes suffer from a very chronic scaly dermatitis on the legs. They are greatly benefited by an application consisting of oil of cade (prepared from tar) and cod-liver oil. As the condition improves, the proportion of the oil of cade should be increased, and "by the time the cod-liver oil has disappeared from the prescription, the leg is usually well!"

In obstinate cases, where the deeper tissues have become thickened, the upper hard skin must have a more severe treatment. It may be scrubbed with soap spirit or soft soap, and dressed with soap plaster, containing 2–3 per cent. of salicylic acid, spread on linen. This treatment, together with massage, should be employed until the skin is quite soft and supple, and all thickening has disappeared, or the condition may return. In still worse cases, the upper layers of the skin are dissolved off with caustic potash before a dressing is applied. This is very painful, but exceedingly useful when other means fail.

Sometimes, in very thickened skin, fissures or cracks occur, owing to the stiffness and hardness of the skin. They are treated by tar and salicylic acid in ointment, varnish, or plaster.

As has been said, anything which irritates the skin will cause inflammation in some degree. Irritants are of very varying kinds. They may be *physical*, such as light, heat, or cold; *chemical*, such as many drugs, poisonous plants or woods, soaps, dyes, and so on. Irritation may be due to *infection*, using the word in the widest sense, and including infection by insects, such as in scabies ("the itch"); fungi, such as in ringworm; and germs, as in lupus or tuberculosis of the skin.

Treatment.—The treatment of dermatitis or inflammation of the skin has already been discussed from the local point of view; that is, as far as regards applications to the skin itself. The aim in treatment is to take away what the skin has in excess, and to supply what it has not; for instance, to remove discharge, scales, or thickened skin; to supply fat to a dry skin; to relieve itching and heat. It is hoped by these means that the skin will be sufficiently put at rest to cure itself.

Diet.—As, however, the skin takes such an important part in getting rid of waste products of the body, it should not only be put at rest from without but also from within. A generation or so ago dermatitis was treated almost too much by dieting, and in most cases from the point of view of experiment rather than of exact knowledge. It was known that some articles of food produced a rash in some people, but "idiosyncrasy" was not heard of then, and the tendency was to forbid anything that had ever been known to cause dermatitis! The result was that many patients suffering from skin trouble were restricted most rigidly to a few articles of diet and, as is now known, quite unnecessarily. Each case must be decided on its own merits. Mutton may cause, or increase, dermatitis in one patient, and beef be quite harmless; while in another the exact opposite is the case. And so with all the other foods that have been forbidden from time to time —fish, cheese, porridge, fruit, etc. etc.

Sometimes a patient knows quite well that a certain article of food increases his skin trouble; but in doubtful cases a skin test may be used. The patient may then have a reasonably plentiful and varied diet, and be quite certain that he is safe from adding to his skin trouble.

There are, however, a few special cases that need mention. In very acute inflammations of the skin the temperature may be raised (though this is rare except in children), and in these cases the diet should be as for a feverish condition. In any case where the trouble is severe, the diet should be light and readily digested. If other diseases are present, such as any form of indigestion, diabetes, or pernicious anæmia, in which a special diet is part of the treatment, they should have preference in treatment; but, if possible, any food *proved* to increase the skin rash in a particular case should be avoided.

Foods that warm and flush the skin, such as very hot drinks, spiced dishes, curries, pickles, condiments, and salted meats, should be avoided. These stimulate the circulation in the skin, and thus tend to increase dermatitis; they also increase any itching that may be present. At one time tea was universally condemned, but the general opinion now seems to be that freshly-made tea, drunk in moderation, and not too hot or strong, does very little, if any, harm to an inflamed skin. Very hot, strong, "stewed" tea is certainly harmful, as it tends to flush the skin. Coffee, especially when strong, has rather a special effect in increasing itching; this is chiefly noticed if there is dermatitis about the anus or back passage. It is therefore better avoided. Cocoa, chocolate, ovaltine, and other drinks of this nature, are quite harmless unless drunk very hot.

A special word must be said about alcohol. It is sometimes said that alcohol "goes to the head," or "goes to the legs," according as to how an individual is affected by its use; but it certainly "goes to the skin" in all cases. It has a greater power than any other food of increasing the circulation in the skin, and so flushing and warming it. Any form of dermatitis is rendered worse by alcohol, especially the more acute forms, and those in which itching is found. It must therefore be avoided whenever possible in such cases.

Water, and plenty of it, is the best drink for those suffering from any skin trouble. Mild mineral waters are well enough, but the stronger ones, especially those containing many alkaline substances, should be avoided.

Soap and Water.—It was once commonly believed that soap and water were bad for skin diseases, and the old belief is still widespread. Doubtless, years ago, when the water-supply was not so pure as it is now —possibly drawn from wells, and containing a large quantity of salts as well as other irritating ingredients—this may have been true. It is still true in some places where the water is very hard. A moderate use of soft water, however, though it may cause a slight increase of irritation in an acute dermatitis, more than compensates for this by removing scales, discharge, and germs from the skin. An oily dressing may need to be used afterwards if the skin tends to crack and dry.

It is often better to use almond- or oatmeal instead of soap; these help to soften the water, and feel very cleansing to the skin. Far from irritating it as does soap, they tend to soothe it. If it is absolutely necessary to use soap in a case, the patient should choose a pure, superfatted, unscented kind; he may make experiments to decide which variety suits his skin best; and should use it as little as possible.

The above advice refers to the more acute types of eczema; in the chronic, dry, hard, and scaly forms it is not necessary to employ such tender measures. On the contrary, household "soft soap" and a stiff nail-brush are often very helpful in breaking down the hard skin; or still more severe methods may be devised.

Climate.—As in diet, so in climate: the general condition of the patient must be considered first. A tubercular patient benefits from a clear, clean atmosphere such as is found in the Alps, or by the sea, though the former may be too sunny for his dermatitis, and the latter too irritant from the salt-laden air. It will be found in many cases that as his general condition improves his skin condition will also improve. In ordinary cases, however, residence by the sea, especially on the north and east coasts of England and Scotland, renders dermatitis worse. An exception must be made in the case of the more chronic diseases, such as

psoriasis, which do not suffer, and in which warm or hot sea-water baths are often of benefit.

In very hot regions an acute moist dermatitis is often rendered worse by the increase in the discharge made by the pouring out of the sweat, while a "dry eczema" is improved thereby.

Exercise.—A patient suffering from dermatitis should take regular exercise in order to keep himself in as good health as possible, except in acute cases, where rest is desirable. In the less acute, but still moist forms, he should not take such exercise as will induce him to perspire freely; in the chronic dry forms, free sweating is not only permissible but desirable.

Vaccines.—Dermatitis from any cause may become infected by germs, which may be quite harmless on healthy skin, but "become fruitful and multiply" when bathed in the discharge from an inflamed skin, and are soon strong enough to produce and keep up a dermatitis by their own power. Vaccines are sometimes very helpful in these cases, but in other cases there seems to be little or no improvement from their use. They are certainly worth trying, however, in all cases of dermatitis that are either due to or have become infected by organisms.

DERMOGRAPHIA (Skin-Writing).—Dermographia is a peculiar condition in which one is able to write or draw a pattern on the skin, and the result is immediately shown in vivid red raised marks. The patterns usually remain quite visible for several minutes, then gradually fade.

This peculiar condition often accompanies urticaria or nettle-rash, but the patterns usually itch, while in true dermographia the patterns do not itch. Nothing can be done for this condition; it is one of those medical curiosities which is due perhaps to some disorder of the nervous control.

DERMOID CYSTS.—This is the name applied to growths found in the body which contain structures that really belong to the skin. For instance, skin itself may be found growing inside, or hair, etc. (*See also* CYSTS.)

DESCENDING COLON.—Part of the large intestine. (*See also* INTESTINES.)

DESQUAMATION.—Derived from a Latin word meaning to scale, the term desquamation is used to describe the peeling of the skin which follows certain diseases. In scarlet fever, peeling of the skin is one of the most common symptoms; in severe cases considerable loss of hair may accompany peeling. Desquamation of a branny appearance follows the fading of the spots in measles.

DESUDATION.—This term is applied when any unusually violent sweating takes place. The term is also applied to a slight skin rash which appears, due to sweating. Children very often suffer from this condition when they are too warmly clad. The skin should be dusted with a powder, consisting of zinc oxide and starch. (*See also* SWEAT, DISAGREEABLE.)

DETERGENT.—This name is given to any drug or substance which is used for cleansing or purifying. Soap, for example, is a detergent. Many alcoholic preparations are used to cleanse greasy skins.

DEVONSHIRE COLIC.—It was thought, at one time, that colic was due to drinking cider, because in districts where much cider was made, especially in Devonshire, many cases of colic arose through drinking it.

It is now known that the symptoms of colic arose through lead poisoning. Possibly some of the barrels in which the cider was stored had lead parts attached to them, and the cider gradually dissolved part of the lead. Now that the real cause of the colic is known, precautions are taken to see that no lead ever comes in contact with the cider, so that no fear of colic from lead-poisoning, due to cider-drinking, need be experienced nowadays.

DHOBIE ITCH.—This is a Hindu name for ringworm of the body. It is a disease which is very common in the tropics, and it derives its name from the belief that clothes become infected while being washed. The washerman in India is known as the dhobie. Full description of the disease is given under RINGWORM.

DIABETES (DIABETES MELLITUS).—Diabetes mellitus is the medical name for the disease which is commonly known simply as diabetes, or sugar diabetes. It is, unfortunately, a fairly common disease after middle-age and used to come sooner or later to a fatal ending; but with the newly-discovered treatment by *insulin*, diabetic people can now lead useful lives and live to die of other causes at a normal age.

Throughout literature from the earliest

times, there are references to a mysterious disease, which was accompanied by the passage of large amounts of urine and other diabetic symptoms, but it was left to an English physician, Thomas Willis, to make the discovery that the urine in this disease was sweet. This was done by the obvious process of tasting the urine, when it was discovered to be "wonderful sweet," as if it contained honey or sugar! It was another hundred years, however, before another English doctor. Dobson, carried out various experiments with the urine of diabetic people, and noticed that such urines fermented like alcohol; and therefore, he came to the conclusion that the sweetness observed by Willis was due to sugar, a fact which he was later able to prove. This sugar, which is known as dextrose, glucose, or grape sugar, is obtained from the carbohydrate or starchy materials which are taken as food, but a certain amount comes from the protein parts of the diet as well.

Symptoms.—A typical case of diabetes is a wasting disease, with the well-recognized symptoms of passing large quantities of urine (polyuria), thirst and hunger, together with sugar in the urine (glycosuria). If the malady is left untreated it will continue to get worse, until the patient falls into a fatal coma or state of unconsciousness. There are, however, all shades of severity of the disease, from a condition in which there is merely a trace of sugar in the urine, to one in which the symptoms are so pronounced as to make the patient seriously ill.

It is usual to regard everyone who continually has sugar in the urine as diabetic; but t must be emphasized that sugar in the urine, especially when it is only temporary, is not of such great importance. It is really quite a frequent occurrence. Some cases are due to leakage of sugar from a faulty kidney, and many untreated cases of persistent and fairly well-marked sugar in the urine never develop into true diabetes. The exact amount of sugar present can only be measured after a meal of carbohydrate has been eaten, and where diabetes is suspected this examination is well worth doing, because in many cases it will save the person, who is merely suffering from the simple condition, an unnecessary amount of bodily and mental anguish. The onset of the disease is gradual, and either the frequent passing of urine or a marked thirst may be the first things to direct attention to the condition. It may set in more rapidly after a sudden emotion, injury, or severe chill. The thirst is often very distressing. Large quantities of water are required to keep the sugar in a liquid state, so that the body may get rid of it in the urine. The amount of fluid taken is in proportion to the amount passed as urine. The digestion remains good and the appetite may be enormous. The tongue is usually dry, red and glazed, and the saliva is scanty. The gums become swollen. In spite of the enormous amounts of food consumed, the patient usually becomes very thin and wasted, the skin is irritable, and there is constipation.

Complications.—Coma: The most serious complication of severe diabetes is coma or unconsciousness, which is caused by poisoning of the blood, or *acidosis*, caused by the faulty chemistry of the body. In a typical case of coma there is difficulty of breathing, the pulse grows weak, and the patient gradually loses consciousness, sinks into a deep coma, and dies, sometimes within twenty-four hours. The coma may come on without any warning, or there may be headache, thick speech, and a staggering gait before the coma comes on. In other cases there may be weakness, giddiness, and livid hands and feet, especially after exertion, preceding the onset of the coma.

Skin Eruptions: in diabetes, boils and carbuncles are very common. Eczema and intolerable itching are very often present. Profuse sweats may occur, and in certain cases there may be "bronzing" of the skin. In extreme cases the extremities may become gangrenous.

Other Complications: Diabetic persons are very liable to lung and tuberculous troubles, and are often carried off with an attack of pneumonia. There may be some degree of kidney trouble causing swelling of the feet and ankles, but general water-logging of the tissues is rare owing to the amount of urine that is passed. Neuritis, neuralgia, numbness, and tingling in the limbs are common. A diabetic person is often morose, and some become restless and anxious to a degree. In diabetes the sexual function is impaired and impotence is common, and is usually an early symptom. It is rare for a diabetic woman to conceive, and if she does she generally has an abortion but a diabetic mother may bear a

healthy child. There is, in fact, no known instance of a diabetic mother having a diabetic child.

Treatment of Diabetes by Diet.—Diabetes is due to a change in the organ called the pancreas, and from the nature of things this change must be progressive if left untreated, otherwise the condition would never have manifested itself. This progressive tendency may be checked by dieting, but may unfortunately be made worse where the diet is unsuitable. In some cases the tendency to become worse is very marked and even suitable dieting will fail to check it. These are the cases where the preparation called *insulin* is necessary. As a general rule dieting is sufficient for slight cases.

For the characteristics of the three main articles of diet, protein, fats, and carbohydrate, *see* the SUPPLEMENT ON DIET AND INVALID COOKERY. It is sufficient for the present to repeat that any of these may produce some sugar during the course of digestion, or cause acidosis if not given in suitably proportionate quantities. This especially applies to a diet which contains too high a proportion of fat and too little carbohydrate.

The value of each type of food is measured by the amount of energy it can give when it is digested, and according to the amount of energy which is necessary for a person of a certain weight, so the total amount of food should be regulated to correspond. This total has to be made up of the three main food substances in their correct proportions.

It is essential that the changes in diet should be made gradually, so that the patient may become accustomed to them by degrees, and so avoid digestive disturbances. In each particular case the diet suitable must be worked out by giving small amounts of food to begin with, and then slowly increasing the amount to the quantity which suits the individual. The patient is first starved till there is no sugar in the urine: increasing amounts of food are then given day by day until there is sugar in the urine. This gives the tolerance limit for that article of food,and on this knowledge the final diet is worked out.

The fasting is not really starvation, since as much tea, black coffee and beef tea as are required may be taken. Smoking may be allowed. When there is no more sugar in the urine the patient can start on a very little protein and a little fat. It is essential to know how much energy the food contains, and it is also desirable to give plenty of bulk in the food to ease the pangs of hunger. As the diet for diabetes is so very important it has been thought advisable to include diet tables at the end of this article.

Causes of Diabetes and Discovery of Insulin.—The part of the body which is not working properly in diabetes is the little organ lying near the stomach, which is called the pancreas in human beings. In animals it is called the sweetbread. For a long time it was thought that the pancreas as a whole was out of order in diabetes, and attempts were made to treat diabetes with extracts from the pancreas, but these were not successful. It was only in 1922 that it was realized that it was the substance produced by a small group of cells situated in the material of the pancreas and called the *insulæ,* or islets of Langerhans, that was responsible for seeing that the sugar taken into the blood was burnt up into energy and made use of by the body. For such a small part of the body the responsibility of these little cells is great. It is now known, therefore, that only when these cells in the pancreas are out of order is there the condition called diabetes.

After this discovery, the obvious thing was to try to obtain the particular juice that the islets of Langerhans manufacture, in order to feed it to patients who were dying for lack of it. This was at last accomplished by the unceasing efforts of the young Canadian doctor, Frederick Banting. His preparation was given the name of *insulin,* and will remain one of the great discoveries of all time. Many people who were condemned to a miserable and inevitable death from diabetes ten years ago are now happily carrying on their work. A great English actress was in the last stages of decline with diabetes and was able to make a return to the stage, which appeared almost miraculous. A young American doctor, Minot, was enabled by Banting's discovery to regain his health and carry on with his research work, which led to the almost equally great life-saving discovery of the use of liver in the treatment of pernicious anæmia, a disease which, like diabetes, meant an inevitable and lingering death. All over the world there are cases like these. Alas, the treatment is still very expensive;

but unceasing efforts are being made to find a cheaper means of obtaining insulin in large quantities. In this connection the thanks of the community in the British Isles are due to the body called the Medical Research Council, which took steps to control and promote the manufacture of insulin in this country, so that it should be reliable in strength and action. If this had not been done the market would soon have been flooded with useless preparations claiming to have the same effect as insulin, and an excellent remedy might have fallen into disrepute.

Insulin Treatment.—As has been stated above, the first hope of the diabetic patient is in diet, but if this fails insulin must be resorted to. It must be remembered, however, that it may take some months to find a suitable diet on which the patient does not lose weight and on which his general condition does not get worse. The strength of insulin preparations is measured in "units" according to its effect on the sugar in the blood. Unfortunately, patients vary in their response to insulin, so that the present "unit" of measurement is not very accurate, but it is the most satisfactory way of measuring the strength of insulin that has yet been discovered. Most preparations of insulin are such that a cubic centimetre of the liquid contains 10 or 20 units of insulin.

Symptoms.—Insulin poisoning may appear when insulin is being given in too large doses. The face usually flushes with a sweating which may be very marked; the patient feels giddy and has a distinct sense of physical coldness about the limbs and there may be blanching of the face. Sometimes the first symptom is a feeling of nervousness or distinct tremulousness, so that the patient finds it impossible to co-ordinate his movements, e.g. if he tries to write he sprawls on the paper. There may be some vague feelings of apprehension —a fear of some disaster about to take place. Later, confusion and delirium may occur, with finally collapse and unconsciousness. Convulsions are rare.

These symptoms usually come on from 1 to 3 hours after an injection of insulin, but not infrequently may be seen from 4 to 6 hours, or even 12 hours after injection.

Sugar given by mouth will quickly relieve all the symptoms, so that there is little or no danger associated with the use of insulin if the patient is carefully warned to take sugar whenever any symptoms, such as those described, follow on injection. Any kind of sugar will do, but glucose is the best. The patient should carry with him some barley sugar, and he soon begins to recognize the symptoms, and by taking the sugar can prevent their further development.

Should the patient be unconscious the sugar must be given by injection into the veins and the collapse treated on the usual lines by stimulation with suitable drugs (strychnine, camphor, hot coffee, etc.).

Effect of Insulin on the Diabetic Condition.—The insulin acts by restoring the diabetic patient to a normal individual. The food must be regulated and the necessary insulin dosage discovered and taken with the utmost regularity. When this is done, the blood sugar can be kept at a normal value. Many patients with long-standing diabetes are able to resume work, and appear to be as fit as the average person.

Insulin is required in cases where the diet treatment does not effect an improvement, and in patients where the diabetic condition is associated with definite symptoms such as:

Eye changes, which often end in blindness; neuritis of various degrees; intense local and general irritation; weakness of the limbs, and pains in the back and sides; diabetic gangrene.

The most tragic of these is blindness. Much can be done to prevent this calamity by treatment at an early stage, but once definite eye symptoms are established, treatment has very little effect.

It is important, of course, to be certain that the case is one of sugar in the urine due to diabetes, and not a case of *renal glycosuria*, where the sugar leaks through into the urine from the kidney. In this case the insulin will only lower the blood sugar still further and may give rise to signs of insulin poisoning.

In young people, and those in whom the disease is fairly acute, it is probably advisable to give insulin, as this gives the best chance for the diseased pancreatic cells to regain some of their activity.

Contraindications to Insulin Treatment.—Insulin does not cure diabetes: the disease is essentially progressive in nature. In the young, however, there is definite evidence that recovery of the cells of the

pancreas may take place when the disease is controlled by insulin, though no cases of a cure have yet been recorded.

The aim is to arrange a diet and to give the patient the necessary amount of insulin to keep his urine sugar-free.

As a rule the best results are obtained by placing the patient on a fixed diet which is calculated to be sufficient in all respects, and then to give increasing doses of insulin until satisfactory results are obtained.

The protein should be in the neighbourhood of ½ gramme or less per pound weight, while the carbohydrate should be small and the fat content comparatively high. The carbohydrate content should not exceed ⅓ of the weight of fat. Starch should be given when possible.

DIET NO. 1. FOR MODERATELY SEVERE CASES OF DIABETES.

Breakfast (9.30 a.m.).
2 ounces bacon.
1 egg.
1 ounce white bread.
½ ounce butter.
½ ounce thick cream.
4 ounces vegetables (Group A).

Lunch (1 p.m.)
Beef tea.
4 ounces white fish.
½ ounce Callard's starch-free bread.
½ ounce butter.
½ ounce cheese.
1 ounce thin cream.
2 ounces vegetables.

Tea (4 p.m.).
Tea.
½ ounce thin cream.
½ ounce kalari biscuit (Callard).
½ ounce butter.

Dinner (6.30 p.m.).
Clear soup.
4 ounces meat.
1 ounce bread.
½ ounce thick cream.
½ ounce cheese.
½ ounce butter.
4 ounces vegetables.
Coffee.

DIET NO. 2. FOR VERY SEVERE CASES OF DIABETES

Breakfast (9.30 a.m.).
Tea, coffee, or beef tea.
½ ounce thick cream.
2½ ounces ox-tongue.
1 egg.
½ ounce starch-free bread (Callard's or Allenbury's).
1 ounce butter.
4 ounces green vegetables (Group A).

Lunch (1 p.m.).
Beef tea or bovril.
2 ounces white fish (any kind).
½ ounce starch-free bread.
1 ounce thick cream.
1 ounce butter.
5 ounces green vegetables.

Tea (4 p.m.).
Tea.
½ ounce thick cream.
½ ounce kalari biscuits (Callard's).
½ ounce butter.
2 ounces vegetables.

Dinner (6.30 p.m.).
Clear soup.
4 ounces meat (any kind).
4 ounces vegetables.
½ ounce starch-free bread.
½ ounce cheese.
1 ounce butter.
Coffee.

In Diet No. 2 no ordinary bread is allowed, so that the carbohydrate content is very considerably reduced. To eat up the butter, a starch-free variety of bread is allowed.

These diets are given only as indications of the lines to be adopted, and may require modification according to circumstances. Experience shows that provided sufficient insulin is taken there are fair limits of diet between which the patient can live and thrive. Weighing every article should not be necessary. Once the diet is settled, it is only necessary to teach the patient how much food is represented by a given weight, and he soon learns to eat approximately the same amount of food each day without weighing it. The insulin is given twice a day, by injection about thirty minutes or so before the morning and evening meals. The dose should start at 5 units, and gradually increase till the sugar disappears from the urine.

Any illness, such as an ordinary cold, an attack of influenza, or practically any deviation from normal health, may give rise to marked increase of sugar in the urine even when the patient has remained on a constant

diet and the dose of insulin which is normally sufficient to keep him sugar-free. Such patients may even pass into diabetic coma as a result of some trifling ailment. Greatly increased doses of insulin must then be used for a time, and the same increase should be given before a surgical operation. Before insulin was available the surgeon hesitated to incur the grave risk associated with an operation on a diabetic person. In desperate cases, when an operation had to be attempted, coma often supervened and the patient died. Since the advent of insulin it is safe to say that the diabetic person has as good a chance as a normal patient.

Insulin in Reproduction and Pregnancy.—It was the common experience in the days before insulin that in diabetes the courses disappeared sooner or later. Even when this function persisted, pregnancy was very rare, and, if it did occur, the strain on the mother was so great that it seldom ended satisfactorily. Nowadays it is fairly common to meet with diabetic patients on insulin treatment who become pregnant and bear children without any undue strain or detriment to their condition. The average diabetic patient who becomes pregnant runs no greater risk than does the average normal woman, provided she is carefully treated on modern lines.

DIABETES INSIPIDUS.—This is a chronic disease in which there is a great increase in the amount of urine passed, but it does not contain sugar as does the water in ordinary diabetes. It is rather a rare disease. It is sometimes popularly called "drinking diabetes," the word drinking not referring to alcoholic drinking but to the fact that one of the chief features of this form of diabetes is a terrible and unquenchable thirst, so that the victims drink quarts of water or other liquids which seem to pass straight through them without appeasing their thirst. The condition is most common in early manhood, and sometimes it seems to run in families, especially in families where there is a marked tendency to nervous or mental troubles.

Symptoms.—The two most noticeable symptoms which are also present are the increase in the amount of pale-coloured urine passed and the noticeable and distressing thirst. The beginning of the disease may be very slow and practically unnoticed or it may come on very suddenly. The frequency with which the patient has to make water causes distress and discomfort during the day and loss of sleep during the night. There may be as much as 20 pints of urine passed in 24 hours. At first the amount of urine is greater than the amount of fluid swallowed, the extra amount coming from the food and from the tissues of the body. Later on this ceases to be so. As has been said above, there is no sugar in the urine. The thirst is very great, and there is a case on record of a young man who drank 70 pints of fluid daily and passed about 80 pints.

The mouth, tongue and throat are dry and parched and the appetite is usually increased. The skin is dry and harsh. The temperature is generally below normal, and in the early stages the digestion may be good. The condition may be caused by damage in the brain or nervous system. There may be pains in the back and the legs or a tingling and itching in the skin.

Treatment.—At times the condition is so slight that it may be regarded as an annoyance rather than as a disease, but in severe cases the patient gets gradually worse. The muscles waste and the digestion fails, while the patient becomes drowsy and finally falls into a state of coma which lasts until death. The blood should always be tested for syphilis. No attempt should be made to reduce the amount of fluid swallowed by the patient, but it is sometimes useful gradually to leave meat and salt out of the diet. Hypodermic injections of pituitary extract are very useful and sometimes have a really dramatic effect in relieving the condition. Cure sometimes takes place of its own accord. (*See also* Ductless Glands; Pituitary Gland.)

DIACETIC ACID.—This is an acid present in the urine in certain stages of diabetes and other diseases. If diacetic acid be permitted to continue to accumulate in the body it may lead to a very serious condition. It is important, therefore, to have a test made of the urine if there are any signs of acidosis in the body.

DIACHYLON PLASTER.—Diachylon plaster is the ordinary sticking-plaster made from a preparation of oxide of lead.

DIAGNOSIS.—Diagnosis is the art of being able to distinguish one disease from another. When the doctor is called in to see a sick person, the first thing he does is to start finding out what is wrong with his patient;

in other words, he tries to make a diagnosis. Sometimes he may require to examine the urine or the blood chemically or microscopically; sometimes the examination of the eyes or the larynx may require the help of a specialist. Sometimes X-ray, or bacteriological examination may be necessary, and in obscure diseases the advice of a consulting physician or surgeon. Some diseases are very easy to diagnose, the symptoms are so definite; but there are times when it is not so easy for the doctor to arrive at a correct diagnosis without first knowing quite a lot about the patient. In nervous diseases especially, it is important that the doctor should know something of the past life of his patient and also of any inherited diseases or complications. This is known as a "history" of the case, and it is here that the patient may be of great help to the doctor.

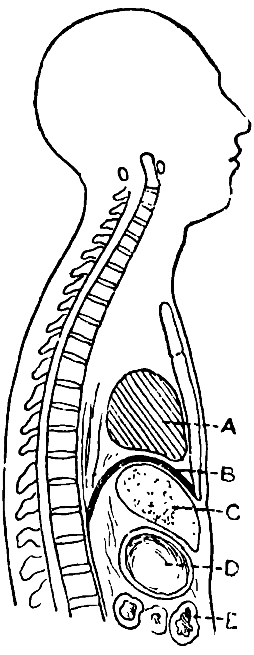
How a Patient Can Help Diagnosis.—Any past illnesses the patient may have had should be told in full to the doctor, as they might throw some light on the present condition. Residence abroad, especially in the East, often has an effect on a person's constitution, so such points should not be overlooked as unimportant. If the patient is a heavy drinker he should not hide this information, though as a rule, a heavy drinker shows signs of his weakness on his face. Anyone who has at any time suffered from syphilis should say so without delay, as this knowledge may be of the utmost importance.

It is not unusual for a patient to keep back information from the doctor from a false sense of modesty. Needless to say, such a situation is not only unfair to the doctor but unfair to the patient himself, because unless the doctor is in a position to make an accurate diagnosis of what is wrong with his patient, he is not in a position to give the correct treatment. It is, therefore, necessary for the patient to be as truthful and as helpful as he possibly can be when the doctor is trying to make a correct diagnosis.

DIAPHORETIC.—This is the name given to any drug or treatment which causes the skin to sweat freely. Turkish baths or hot-air baths are very good examples of a diaphoretic, and certain drugs may be given which act on the nerve centres and produce an increase of sweat.

In many diseases it is desirable to make the patient sweat in order to reduce the bodily temperature; there is a loss of heat caused by the evaporation of the sweat. At the beginning of a fever the patient may be given a mixture containing spirit of nitrous ether and acetate of ammonia every three hours. This tends to cool the patient down without producing any unpleasant effects.

Diaphoretics are often used in diseases of the kidneys, especially if the patient shows signs of dropsy. When the kidneys have stopped working it is necessary to make the body get rid of its water in some other way, and this is done by causing the patient to sweat. Sweating can sometimes be quickly induced by wrapping the patient in hot blankets and surrounding him with hot-water bottles. Pilocarpine is a drug which is used to produce sweating, but this should only be given under medical supervision. Sweating is also useful as an aid to ridding the body of poisons. (*See also* BATHS; FEVER; SWEAT.)



Diaphragm:
A Heart; B Diaphragm, C Liver; D Stomach; E Intestines

DIAPHRAGM.—The diaphragm is the dome-shaped muscular partition which separates the space of the abdomen from that of the chest. It is more popularly called the midriff. It is the chief muscle used in breathing, and when air is drawn into the the lungs the diaphragm is able to be expanded. Singers and athletes are trained to breathe through the diaphragm rather than the chest.

DIARRHŒA.—The condition where the bowels move too frequently and the motions are of too soft a consistency is known as diarrhœa. It is not a disease in itself, but

rather a symptom of various diseases. It may be brought on simply by taking too strong medicines or by eating unsuitable food or too much fruit. Damp and cold will bring on diarrhœa in some people, and various nervous conditions may be responsible for an attack. Nervous excitement such as that experienced by students just before an examination is a well-known cause of diarrhœa.

By far the most common cause, however, is eating tainted or indigestible food. These foods set up irritation in the bowel and may be accompanied by severe colicky pains and much wind. In such a case, the first thing to do is to get rid of the irritating substance in the bowel, and this is done by taking some opening medicine. A large dose of castor oil should be taken, and when the bowels have been thoroughly purged, a chalk or bismuth mixture may be taken to clear up the diarrhœa. If there is much pain or exhaustion, a doctor may prescribe opium, which is very soothing to the irritated bowel. The diet for the next few days should be as simple as possible and should contain such things as arrowroot and cornflour, etc.

When treating chronic diarrhœa it is important to bear in mind that it is a symptom of some other condition and not a disease in itself. It is necessary that the real cause of the diarrhœa should be discovered so that suitable treatment may be given as quickly as possible. Whenever diarrhœa continues in spite of the most simple forms of treatment, or whenever undue straining occurs, or when blood is passed, the doctor should be called in so that the proper treatment may be carried out. Great harm is often done by treating an acute condition of the bowel with opening medicines. For diseases of which diarrhœa is symptom, *see also* CHOLERA; COLITIS; DYSENTERY; ENTERITIS; INFLUENZA; TYPHOID FEVER.

Summer Diarrhœa. — Summer diarrhœa is also termed summer or infantile cholera, epidemic gastro-enteritis and infective diarrhœa. Epidemics of this disease occur in almost every country during the summer and autumn months. Infants and young children are particularly liable to attacks of this condition, which is due to the bowels becoming infected with germs through eating bad food. In the case of bottle-fed babies, dirty milk or bottles are the greatest source of danger. Milk should never be left uncovered, especially during the hot weather, but should be stored away in a cool place where flies are not able to get at it. It should be sterilized, and bottles and teats should be thoroughly boiled before being used.

Symptoms.—The motions are green in colour, slimy and foul, and of frequent occurrence; in severe cases there may be blood-stained mucus as well. There is usually a high fever and the temperature may be extremely high, or it may be below normal. Convulsions are common and the child may pass into an unconscious state. An attack of this disease begins very suddenly and it is very severe while it lasts; the child quickly becomes wasted and shrunken, and in severe cases, death may occur within 24 hours.

Treatment.—As soon as the symptoms are recognized, all milk should be stopped and the child should be given cold boiled water or whey and water for 24 hours; this will often cut short a serious attack. The rectum should be washed out very gently by means of a fine catheter with weak solutions of bicarbonate of soda at least once a day. If, in spite of these simple measures, the illness continues, the doctor should be called in immediately as it will be necessary to take further steps in the matter of treatment. Injections of normal saline may have to be given in order to make up for the large amount of fluids which are being lost.

DIATHERMY.—Diathermy is a form of electricity which is used both medically and surgically in the treatment of disease. Medical diathermy can be applied generally to the whole body, or locally to one particular part of it only. The method of its application to the patient is similar to other forms of electrical treatment; but in diathermy the *electrodes* which connect the patient with the electrical current must be kept in firm contact with the patient's skin, and the patient must be told never to change the position of one of the electrodes after the current has been turned on. Should he feel too much heat he must at once tell the operator, who will reduce or turn off the current. If a patient sitting on an electrode moves his position, even contact with the current may be disturbed and a burn may be the result. Or if contact is totally broken, perhaps only for a moment, a spark will jump the gap as the last point of contact is severed and cause a small, but deep and slow healing

wound. This extra care required to protect the patient makes diathermy a form of electricity which requires to be administered only by specially trained persons.

Diathermy has a similar effect to high-frequency electricity, but is stronger and diathermy fails to give relief from pain. This may be due to the absence of the spark effect. Its chief characteristic is to produce heat throughout the tissues. Flushing of the face and free sweating are easily produced and the temperature of the body can be raised by diathermy. This last is a property which may in time be used in the treatment of certain severe diseases.

Surgical Diathermy is becoming more popular every year and in many cases has decided advantages over the older method of cutting through the tissues with a knife. The diathermy knife, which is a thin little blade of metal, passes through flesh with the sharpness of a knife, divides the tissues rather than cuts them and causes no bleeding, or practically none. Great advances in the use of this method of surgery may be expected. At present it is used chiefly in the removal of large growths such as cancers. One form of diathermy which works by sparking is very useful in the removal of small warts, corns, piles, birthmarks, etc.

When Treatment by Diathermy is Useful.—Medical diathermy treatment is useful in chronic inflammation in the pelvis in women, and chronic prostatitis in men; also in rheumatic conditions such as gouty deposits, arthritis, and lumbago. Diseases of the nerves such as sciatica and neuritis respond very well to diathermy, and cases of pneumonia and acute laryngitis have been benefited by it. (*See also* ELECTRICITY.)

DIET.—The question of diet in general and also of particular diets for different conditions is one of such great importance that it has been treated in detail in the supplement called Diet and Invalid Cookery. (*See also* DIABETES.)

DIGESTION.—The various articles of food which make up the average individual's daily diet can be divided into three main classes known as *proteins*, *fats*, and *carbohydrates*. Many of these substances are very complicated from a chemical point of view and are not, generally speaking, easily dissolved by the body juices, so that before they can be absorbed into the blood they must be split up into a simpler form. In the human body these splitting-up changes are brought about by chemical bodies known as *ferments* or *enzymes* of various kinds. There is a special ferment for each particular class of food, and it will not split up any other type of food. The object of these ferments is to break up the food into simpler forms which can be absorbed into the system. After they have been thus absorbed, some of these simpler bodies are picked out by the various organs of the body from the blood-stream and are *built up* into living matter, while others are *burnt up* to provide heat and energy.

Protein or Proteids.—From the chemical standpoint the most complicated food is the "protein." This is the "nitrogenous" portion of one's food containing the *nitrogen*, and is found in meat, fish, cheese, eggs, etc. It is necessary to life, since it is required to repair the tissues of the body. Without protein, life as we know it would be impossible, for the body itself is largely composed of this material, and as waste goes on in the ordinary course of life more protein is required to rebuild the part that has been worn out and destroyed. The fundamental parts of any protein are carbon, hydrogen, oxygen, and nitrogen, and it is interesting to note that the human body is quite unable to make its own supply of protein for itself from these substances, carbon, hydrogen, etc. It has to be supplied with them already built up in the form of food. In this way the body is like a bricklayer who can build houses with bricks, but who is unable himself to make the bricks. After the complete routine of digestion has been gone through, the protein in the food has been broken up into simple chemical substances called *amino-acids*, and in the form of amino-acids the protein is taken into the blood-stream to help carry on the growth and life of the body, while the waste part of the food from which the amino-cells were abstracted is passed out of the body by the bowel or large intestine.

Proteins are contained in such articles of food as egg, meat, fish, bacon, cheese, and some vegetables and fruits.

Carbohydrates.—The next general class of food is the carbohydrate. This is most widely distributed in the form of the "starchy foods," and is present in potatoes, wheat, bread, rice, macaroni, tapioca, sugar, etc.

Carbohydrate digestion is rather simpler than the protein digestion in that all forms have to be changed into a simple sugar known as *glucose* before they can be absorbed. The various sugars in ordinary use, such as cane-sugar from the sugar-cane, lactose, the sugar in milk, etc., all have their special ferment which will break them down to a still simpler sugar. The last and simplest form of sugar into which the carbohydrates are changed before being absorbed into the blood-stream is *glucose*.

Fats.—These are eaten in butter, cream, lard and other animal fats such as beef suet, etc. Vegetable oils are also another source of fats. During digestion fats are split up into the corresponding fatty acid and glycerine and are then rebuilt in the form of the various tissues of the body.

Alimentary Canal.—The digestive tube as a whole is known as the *alimentary canal.* It starts at the mouth and ends at the anus; it is divided up into many different portions.

The mouth is the first portion of the alimentary canal to be considered. It is a cavity containing teeth and saliva. The teeth are primarily meant to bite into the food and to grind it into small particles so that the saliva can come into contact with as much of it as possible. The teeth in the front of the jaw are provided with sharp, chisel-like edges which are well adapted for biting or cutting. Biting a piece out of an apple illustrates the duties of the front teeth very well. Further back, the teeth have large grinding surfaces between which the food is reduced to a finely divided state so that it can readily be mixed with the various digestive fluids.

Mastication.—The jaws appear to move freely during the chewing process, but actually it is only the lower jaw which is movable. The upper jaw is part of the face and only moves with it. The lower jaw, however, is so attached that it can move up and down and from side to side. The up and down movement enables the front teeth to bite into the food, while the side to side movement enables the food to be ground between the back or molar teeth. During this chewing process there is also a forward and backward movement of the lower jaw.

The broad and rough surfaces of the molar teeth are made to slide over each other, thus thoroughly grinding the food which may be between them. Flesh-eating animals have not got broad molars like ours: they bite and tear the flesh on which they feed, generally giving the jaw an up-and-down movement only. On the other hand the vegetarian or herbivorous animals have very large and perfect molars, and they give to the lower jaw much greater variety of motion than we do. This is readily observed in the cow, sheep and the horse.

During the chewing or mastication, the food is continually being moved about by the tongue so that every portion of it is brought between the molar teeth. The muscles of the cheeks and lips also help.

Digestive Juices.—The digestive juices of the body (enzymes and ferments) are prepared by means of various glands: a gland is a structure which has the power of separating or forming certain materials from the blood which is flowing through it. Many of the membranes which line the hollow organs of the body also have the power of forming special materials, and therefore they are called "secreting membranes."

Mucous Membrane.—The whole of the interior of the digestive tube or alimentary canal, from the mouth to the rectum, is lined with a soft kind of skin known as *mucous membrane.* At the margins of the lips and of the anus this membrane merges imperceptibly into the skin which covers the external surface of the body. The mucous membrane is richly supplied with minute glands called mucous glands. These glands separate from the blood a slimy fluid called *mucus* which serves to keep the membrane moist and at the same time acts as a very efficient lubricant.

The Salivary Glands.—In addition to the mucous glands the structures surrounding the cavity of the mouth are provided with the special salivary glands. These are big glands, and there are three pairs of them: the parotid, the submaxillary and the sublingual. The parotid glands are placed, one on each side, just below and in front of the ear. They are the largest of the salivary glands, and it is these which become so inflamed and tender in an attack of mumps.• The saliva they make is passed along a tube known as Stenson's duct, which is about one-eighth of an inch in diameter, and this opens into the mouth through the cheek, just opposite the second molar tooth of the upper jaw.

The *submaxillary glands* are about the size

of plums. They are placed beneath the lower jaw, one on each side. The ducts of these glands, known as Wharton's ducts, open into the mouth under the tip of the tongue at the side of the bridle of tissue which binds the tongue down to the floor of the mouth. They can easily be seen with a looking-glass.

The outlines of the *sublingual glands* may also be seen by means of a looking-glass. They are no larger than almonds, and are situated on each side of the bridle forming the ridge between the tongue and the gums of the lower jaw, and are covered only by mucous membrane. Each of these glands has several ducts or channels to carry their juices away. The mixed fluid produced by these different glands is called the saliva, and is a clear thin transparent fluid. In the mouth it is always mixed with the fluid from the mucous glands and this makes the saliva found in the mouth thicker and stickier in character.

Salivary Digestion.—As is the case in all the fluids of the body, most of the saliva consists of water—just over 99 per cent of it. The remaining very small fraction consists of mineral salts and organic matter.

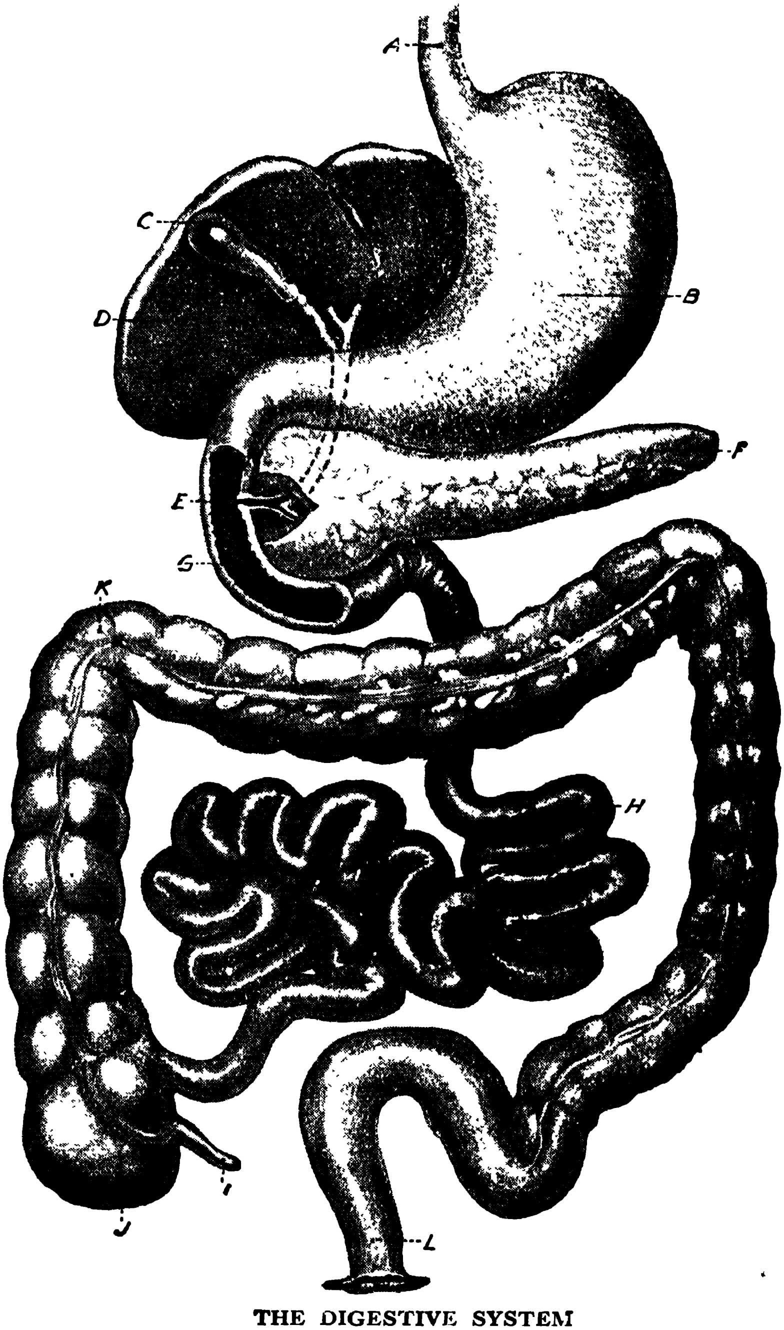
The substance in saliva which takes an active part in digestion is one of the ferments known as *ptyalin.* Many of the foods we eat contain a large proportion of starch (such as bread, rice, potato, etc.), which will not dissolve in water. No food is of any use to the body until it has been turned into a state in which it can be dissolved. Starch therefore, as such, is useless as a food. This ferment or enzyme, known as ptyalin, has the power of doing this: it converts the insoluble starch into a soluble variety of sugar known as maltose. In the mouth this change begins as soon as the saliva mixes with starchy foods. The unchanged starchy substances are swallowed, together with some saliva, and the change of starch into sugar is continued in other parts of the digestive tube for a short while in the stomach, but completely in the intestines, where it is reinforced by a powerful ferment from the *pancreas*—a gland, incidentally, which is very similar to a salivary gland in structure. The saliva acts only on starchy foods.

The term *enzyme* or *ferment* is applied to various substances existing in small quantities in different parts of the digestive system. An enzyme has the effect of causing a chemical change in the digestion of the food with which it is associated to proceed more rapidly than it otherwise would.

In addition to the action of the saliva just mentioned, it is useful as a mechanical agent and general solvent. Together with the mucus it moistens the mouth and thus makes it easier to chew the food. It dissolves substances which are savoury, and thus enables us to taste them. In animals which live in water there are no salivary glands, and those in flesh-eating animals have no chemical action, so that it would appear that the mechanical action of the glands is their more important duty. It also assists in forming the food into a soft mass known as a *bolus* before it is swallowed. The sticky mucus is very useful in preventing any friction.

A feeling of hunger, or the presence and sight or smell of savoury foods, will cause a flow of saliva. This flow of saliva is not due to any chemical reason, but simply to the stimulus of the senses and is known as "reflex." The greater the hunger or the more attractive the food the greater the amount of stimulation of the senses affected and the greater the flow of saliva. This illustrates the importance of attractively cooked meals.

The saliva works best in a neutral or weakly alkaline solution, and it is very susceptible to acid, and is soon killed by the acid in the stomach. It seems likely, therefore, that the action of the saliva is only very temporary, since the amount of acid in the stomach is far greater than is necessary to destroy it. There are several reasons, however, for thinking that the gastric juices do not come into contact with a considerable part of the food for some time after the food reaches the stomach. The saliva is, or should be, very thoroughly mixed with the bolus of food as a result of the mastication, and the swallowed mass is more or less alkaline. The part of the meal directly in contact with the stomach wall tends to neutralize some of the acid. This prevents more acid from reaching the interior portion of the swallowed food for some time. Also the fact that the food in the upper part of the stomach is not subject to much movement at the earlier stages of digestion favours the action of the ferment for a long time. There is little doubt, therefore, that in ordinary circumstances the action of the saliva continues in the stomach for some considerable time. As an instance



THE DIGESTIVE SYSTEM

A Œsophagus or Gullet
B Stomach
C Gall Bladder
D Liver
E Ampulla of Vater (where the ducts of the Liver and Pancreas enter the Intestine)
F Pancreas
G Duodenum
H Small Intestine
I Appendix
J Cæcum
K Large Intestine
L Rectum

of the effect of the saliva, it is found that bread or potato when eaten form sugar almost as quickly as if the equivalent amount of glucose has been taken.

Starch is the only food acted upon by the saliva. From the mechanical point of view saliva is of great importance in enabling us to masticate and mix our food thoroughly, it also acts as a lubricant during the passage of food along the tube which connects the throat with the stomach—the food-pipe or *œsophagus*.

Quite a large quantity of saliva is produced during the course of a day, the amount being from a pint and a half to two pints. The outflow is more or less continuous, but is increased by the presence of any object in the mouth. This object need not be food, a glass bead or pebble will do, and often on a long march soldiers will suck a pebble to prevent the mouth from getting too dry. The thought of food when one is hungry will produce saliva, and also the smell of food will make the mouth water. On the other hand, a powerful emotion, such as that of fright, will stop the flow. One of the old tests of guilt in a suspected person was to give rice to eat. This of course requires a great deal of fluid to swallow it, and the guilty person, being rather afraid that he would be found out, could not produce sufficient saliva and so was unable to swallow the rice. This rough-and-ready test which was merely based on observation is seen to have some scientific foundation.

It is interesting to note that the salivary glands of children do not contain any ferment during the first four months or so of existence. Breast milk does not contain any starch at all. Patent foods for children, therefore, should not contain any starch when they are meant for children under four months, and a guiding principle is not to allow any starch, in the form of potato or bread, etc., until the child has cut a few teeth.

Swallowing into the Stomach.—Food, then, is masticated in the mouth and thoroughly mixed with the saliva. It is collected into a mass known as a bolus by the muscles of the tongue and of the cheeks, and then passed between the tongue and the roof of the mouth till it reaches the back of the mouth. So far all these arrangements are "voluntary," that is to say, they are under the control of the conscious will and can be stopped at any time. Once the food reaches the back of the mouth, the presence of the food will cause the swallowing machinery to come into play, and thereafter the passage of food and its further digestion is entirely beyond the control of the will.

The food has to pass into the food-pipe without touching the back part of the nose or entering the wind-pipe. The back ot the nose is shut off by means of the soft palate. The contraction of the muscles at the back of the throat forces the food over a flap of cartilage at the entrance to the wind-pipe directly into the food-pipe or œsophagus. If one presses the "Adam's apple" during the act of swallowing, it is easy to understand how this is lifted up and the entrance to the wind-pipe, situated just behind the Adam's apple, is raised and comes forward so that food is shot across it.

As soon as the food enters the upper portion of the food-pipe the circular muscles in the walls of that tube contract just above it and force it downwards. In front of the mass of food the muscle becomes relaxed by means of a nervous reflex which is aroused by the presence of the food, so that a regular wave-like motion is set up, a narrow portion being behind the mass of food and pushing it down, and a wider part in front into which the food is forced. The force of gravity enters into the passage of food into the stomach but little, and it is owing to the muscular contraction that one can swallow solids, and even liquids such as water, when standing on one's head.

When the food-pipe is not engaged in swallowing, it is not a hollow tube, but is flattened, its front and back walls being together. In order that the act of swallowing may take place with regularity and ease, the mass of food must be sufficiently large to be within the grasp of the contracting muscles; it is on this account that some people find difficulty in swallowing a pill, especially if it be a small one, unless food or drink be taken at the same time.

The Stomach.—The stomach is a membranous and muscular bag, about ten inches in length from right to left, situated against the front wall of the abdomen and just beneath the partition which separates the abdominal cavity from the chest. This partition is a muscle known as the diaphragm.

The shape of the stomach is very variable, the larger portion, just next to the heart except for the diaphragm, is the larger, and is known as the cardiac portion. When an individual is standing up the shape of the stomach is roughly that of the letter "J." The food-pipe enters the stomach at the top of the letter "J" which is known as the *cardiac orifice*, and the narrow end of the stomach joins up with the intestines by a narrow entrance known as the *pylorus*. Food enters the stomach by means of the upper opening, the cardiac orifice, and after being thoroughly mixed with the digestive fluid of the stomach, passes through the lower opening into the small intestine.

Gastric Juices.—The only important ferment in the stomach itself is *pepsin*, which acts on the complex protein foods. Pepsin is only active in the presence of acid, and in the stomach this acid is that known as *hydrochloric acid*. The pepsin does not break down the protein entirely, and more changes have to take place in the small intestine before it is ready to be taken into the bloodstream.

The digestion which takes place in the stomach chiefly prepares the protein part of the food for the further action of the much more powerful ferments of the pancreas and intestine. The only other important ferment in the stomach is *rennin*, which has the property of clotting milk.

Commercially this ferment is sold as Rennet. It is prepared from the fourth stomach of a calf and is used to make junket.

The walls of the stomach are capable of being stretched a great deal. It can thus adapt itself to the quantity of food it contains and at the same time be always in contact with the food so as to act upon it.

Peristalsis.—Regular wave-like or rhythmical muscular contractions pass down the walls of the stomach. These regular waves of contraction are known as "peristalsis," and by means of them the food is forced all the way down the intestinal canal. It is only in the large intestine, under normal conditions, that waves of contraction are seen to pass backwards, e.g. towards the small intestine, and these movements are referred to as "anti-peristalsis."

The walls of the digestive tube consist in the main of four layers: the inner one is a mucous membrane which contains the mucus-making cells and the mouths of the various glands which are present in the next layer. Then come the *muscular coats*, circular muscle fibres on the inside and muscle fibres placed lengthwise on the outside. Even further outside still is the smooth lining of membrane known as the *peritoneum*. This makes a watery fluid which moistens and lubricates the surfaces of the organs which can thus glide freely over each other.

The Sphincters.—At each end of the stomach the circular muscles are thickened and contracted so that there is no way through them. These areas of circular muscle are known as *sphincters* and they serve as doors to keep the cavity of the organ closed. The lower sphincter, situated at the pylorus and known as the *pyloric sphincter*, is firmly closed during digestion at first. It relaxes at certain intervals and thus allows some of the digested portions to be passed into the intestine.

The time during which substances remain in the stomach varies considerably from one to four hours. It depends partly on the nature of the food and the method employed in the cooking. Normal people will also vary; in some the stomach will empty itself much more rapidly than in others.

Gastric Glands.—The mucous membrane or lining of the stomach is smooth and soft when the organ is moderately distended; but it is drawn up into folds when the stomach is empty. It is covered with cells which make "mucus" to keep the surface moist, and its thickness is due to the fact that it is made up of glands which are like a long tube in shape. Their duty is to make gastric juices, and they are accordingly known as *gastric glands*. There are three main duties of these glands—which are to make the mucus to produce the main bulk of the gastric juice; and to make the acid used in the stomach—the free hydrochloric acid. When the stomach is empty the lining membrane is pale in colour; but as soon as it contains some food, or even something which is not food and which cannot be digested, the supply of blood increases and the mucous membrane becomes bright pink in colour, and the making of gastric juice immediately begins. It can be truly said that the stomach "blushes" during and after a meal.

Gastric juice consists of water, to which are added the pepsin, rennin, hydrochloric

acid and various salts such as phosphates of calcium, magnesium and iron, and the chlorides of sodium, potassium and calcium.

Pepsin is the active part of the gastric juice. In the presence of hydrochloric acid it has the power of acting on the protein foods. It can be obtained in a dissolved state by washing the lining membrane of the stomach with water, or it may be bought in the solid form from the chemist. "Peptonized milk" is milk which has been in contact with pepsin for some time at body temperature. The protein part of the milk is thus partially broken down or "digested," and so it becomes more suitable for invalids in whom the powers of digestion are weak owing to their illness.

Gastric fluid has no action on starchy foods, neither does it act on fats. Starchy foods, as was seen above, are dissolved in the stomach by the swallowed saliva. The rennet part of the gastric juice acts upon milk and clots it.

Fatty tissues consist of fat cells, and each cell consists of a particle of fat surrounded by a cell wall made of a protein. When fatty tissues pass into the stomach, the cell walls are dissolved and the fat is set free in the form of minute globules, giving the contents of the stomach a grey appearance.

Chyme.—The fluid contents of the stomach are known as "chyme," from the Greek word meaning "I pour," because it is "poured" into the intestine and bowel. It consists of saliva and starchy foods in various stages of digestion. Protein food in various stages: undigested fat in the form of globules, mucus from the mucous glands, and a residue of undigestible substances.

Much information as to the processes which take place in the stomach has been obtained from human beings who have had an injury or a surgical operation on the stomach. Food vomited has been carefully analysed, and processes have been studied with the aid of X-rays. For these the patient is given what is known as a "bismuth meal." This is a food which contains a great deal of bismuth or a barium compound. This meal will not allow X-rays to pass through it, and so the outline of a hollow organ containing it is shown up on a screen when examined with the aid of the X-rays.

There is very little material absorbed into the body directly from the stomach. Even water passes through the stomach practically without any lessening in quantity. Alcohol, on the other hand, is readily absorbed, and this is the reason for the rapid effect of alcohol when it is swallowed on an empty stomach.

How Digestion Starts.—The pouring out of gastric juice is usually started by the mental effect of seeing, tasting and smelling appetizing food. The next important thing in stimulating digestion is the actual presence of food in the stomach. Some foods are more active than others in this respect: meat extracts and meat juices are very active; while others, such as milk, bread, white of egg, etc., are much less active.

As the most active substances appear to be present in meat extracts and juices, it is obvious that in the case of people suffering from indigestion associated with excess of acid (acid dyspepsia), meat juices can only make the trouble worse.

Intestines.—The intestines are made on the same general plan as the rest of the digestive tract. They have an outer layer which is made by the peritoneum; the duty of this is to anchor the intestines to the front of the backbone and to convey blood-vessels and nerves to the walls of the intestine. The muscular coat has fibres of muscle arranged lengthwise on the outer surface and round and round on the inside: then a layer of loose tissue between the muscle and the mucous coat. In this layer are found the blood-vessels and nerves which supply the glands, etc., of the mucous coat, and finally the inner mucous layer which contains the various digestive glands.

The mucous membrane of the small intestine is thrown into folds like that of the stomach. Their duty is to increase the area of the secreting surface; to prevent food from passing too rapidly through the intestine, and to assist in the mixing of food with digestive fluids which are poured into the intestine.

There are various types of glands: all of them open on the inner surface of the intestine. The collected juices of all these glands is called the *succus entericus*. This is a yellow alkaline fluid, which consists of several ferments whose duty it is to act on certain classes of food substances.

Digestion in the Duodenum.—The inner side of the small intestine is covered also with

a multitude of very small projections known as "*villi*" which give the surface a fine velvety appearance. Their duty is to absorb food rather than to change food into a form which can be dissolved.

As soon as food has passed from the stomach into the first portion of the intestine—known as the duodenum, it mixes with the very important fluids, known as the bile and the pancreatic juice. The bile is made by the liver and the pancreatic juice is made by a gland known as the pancreas. The pancreas (or sweetbread) is a large gland partly placed within the curve of the first part of the intestine—it lies within a curve made by the duodenum. It is very much like one of the glands which make saliva, but is generally looser in texture. The juices made by the pancreas have a very powerful digestive effect. The chief of them are "trypsin," a ferment which will act on protein; "amylase," which acts on starches, and "lipase," a ferment which acts on fats.

Digestion in the Small Intestine.—The intestinal juice, the succus entericus, is made from the glands from the whole length of the small intestine. It is an alkaline fluid containing many ferments, which bring the now largely broken-up food to the final stages of digestion, ready for absorption into the blood. All kinds of food are being dissolved in the small intestine and the mass as a whole is being slowly urged on. The dissolved portions are rapidly absorbed by the mucous membrane, while the unabsorbed parts pass onwards to the large bowel.

The *chyme*, which is the name given to the mixture of food and digestive juices in the stomach, passes into the small intestine and is then changed in appearance by the addition of the bile and pancreatic fluids; the fats in it make it look like milk. The term *chyle* is applied to the contents of the small intestine.

Digestion and the Large Intestine.—After the chyle has passed along the whole length of the small intestine it enters the large intestine through an opening which is guarded by two folds of mucous membrane. These folds prevent, to some extent, the flow of the contents of the large intestine back into the small one. They form a kind of valve which is known as the *ileo-cæcal* valve.

The movements of the intestine are of two distinct types: one is *peristaltic* and consists of waves of contraction passing progressively and slowly down the intestine. The effect of these waves is to drive the contents slowly onwards. The other type of movement is known as *rhythmic segmentation.* A short length of intestine suddenly breaks up into a number of small segments or portions, and each segment undergoes a similar change. This happens many times and their combined effect is to produce a thorough mixing and absorption.

In the large intestine practically no digestion occurs, but there is a large absorption of fluid, both from the food and the watery and unused portions of the digestive juices. At the end of the small intestine the bowel contents are very watery, but the action of the large intestine makes the residue become more and more solid.

Putrefaction occurs only in the large intestine, which acts mostly as a storehouse. Some absorption, however, does take place as is shown by the absorption of water. There is also some evidence to show that people who are very ill can be kept alive by means of a glucose solution passed into the rectum.

The contents of the large intestine are bacteria, bile, mucus, unabsorbed food and excess of digestive juices. The bacteria form nearly half of the solids excreted.

The fæces are the excretions of the large intestine. Their colour is mostly due to the bile in them, and the mass should be semi-fluid in consistence. The presence of food in the stomach has a marked reflex action in making the rectum contract. This tendency is most marked when food is placed into a stomach which is completely empty, hence the most suitable time to empty the bowels is directly after breakfast. The bowel is also a creature of habits and is far more likely to work efficiently if it is made to contract and expel its contents at the same time every day.

As regards the absorption of food into the blood-stream, it is certain that little or no absorption takes place in the stomach. Water apparently undergoes no absorption at all in the stomach. Under normal conditions of digestion, neither fats nor proteins are sufficiently broken down to undergo any absorption in the stomach. The real and important site of absorption is the small intestine.

Here all the products of digestion rapidly pass into the blood-stream and thence to the various organs of the body, which pick out the material they require and build them up into the substances required.

DIGITALIS.—This is the name of a powerful medicine obtained from the purple foxglove plant which is to be found growing in our woods and hedgerows. Nowadays it is grown specially because of the digitalis obtained from it. The plant is allowed to flower and the leaves are picked and carefully dried before the drug is extracted.

When this drug was first discovered it was used as a remedy for consumption as well as various other conditions, and it was not until about 1860 that it was used as a heart tonic. At first it was hailed as a cure for all heart conditions, but owing to the work of the great heart specialists, Sir James Mackenzie and Sir Thomas Lewis, it has been proved that the drug is only of use in certain conditions. In the condition known as auricular fibrillation, digitalis is capable of giving immense relief and of prolonging life for many years. This drug should only be given under medical supervision.

Poisoning by Digitalis.—Digitalis is known as a cumulative drug, which means that when it is taken, especially for a long period, it is not given off by the body and it gradually causes symptoms of poisoning. Those who have to take this drug, generally stop taking it for one week in four so as to prevent its accumulation in the body.

Vomiting is one of the most common symptoms of poisoning, but the most important symptom is slowing of the pulse. The patient should be made to lie down and an emetic may be given to wash out the stomach. Tannic acid, camphor, or strong tea or coffee should be given and the patient not allowed to get up until fully recovered.

DILATATION.—This is the term used when any hollow part of the body becomes stretched or dilated. Dilatation of the heart occurs when there is an increase in the size of one or more of the heart organs; this usually happens through weakness of the muscles of the heart. In dilatation of the stomach there is usually a great deal of gas in the stomach which is causing it to be blown out.

DILL-WATER.—This is an extract which is given to relieve flatulence and pains in the stomach. It may be given to the smallest child without any danger. A teaspoonful of dill-water, slightly warmed, will be found to give considerable relief in flatulence (wind) of young infants.

DINNER PILL.—Many people take what is known as a dinner pill in the evening in order to clear the bowels after a heavy meal. It is a habit which should be discouraged, as it makes the bowels rely too much on the stimulus of the drug rather than on a natural action. A pill should only be taken if a laxative is required, and those who suffer from constipation should try to cure the condition without relying too much on drugs.

DIPHTHERIA.—Diphtheria is a very infectious disease which attacks the throat, and sometimes the nose and larynx. Not only does the germ of this disease cause the membranes of the throat to become very inflamed and swollen, but it manufactures poisons which are carried by the blood-stream to the rest of the body. These poisons may set up dangerous consequences such as heart weakness and paralysis. The chief characteristic of the disease, however, is the formation of a "membrane" at the back of the throat, which is caused by the lining of the throat becoming so inflamed that it dies and forms an extra covering as it were. This membrane is greyish or yellowish-white in colour and it is very firmly fastened to the throat. Other inflammations of the throat may look like diphtheria, but true diphtheria is diagnosed by the presence of a germ which has the special name of Klebs-Loeffler bacillus. This germ is named after two German doctors who were the first to discover, at the end of the nineteenth century, that diphtheria was actually caused by its presence.

Diphtheria was known in the East for centuries, and it is referred to in the Babylonian Talmud. "Throat Pestilences" are also mentioned as occurring in the Middle Ages. Washington, the first President of the United States of America, is said to have died of this disease. Diphtheria seems to be much more common on the Continent than it is in Great Britain and it never seems to develop very seriously in tropical countries. The majority of cases of diphtheria seem to break out during the late summer months, especially if the weather has been dry. It will be found that by about the beginning of September the

number of cases will begin to increase, and the highest peak is reached in November. After that, a fall in the number of cases takes place and between the months of May and July there may be very few cases recorded.

How Infection is Carried.—The germs of this disease may be carried from one person to another, and the disease is so infectious that even doctors and nurses may become infected from their patients. There is a case on record where a child coughed into the doctor's face while he was examining the throat, and the doctor died within 24 hours from diphtheria. Germs may be picked up from articles of clothing, for although these germs thrive in human beings, they do not necessarily die when separated, but may go on living for months, until chance again allows them to enter another human being. Infection may be spread by those cases where the disease is in the nose or ear instead of in the throat. In these cases a chronic catarrh, containing the particular germ, may be the only sign of the presence of diphtheria, and the infected person may still pass on the disease even though he does not suffer from any general poisoning himself.

"Carriers."—In a large percentage of the cases of diphtheria, the germs simply disappear after the patient recovers from the disease, but there are still a great number of patients who harbour the germs for a long period. These people are called carriers, and in this way it is possible for the germs of the disease to be passed on. Another type of carrier is the person who, while enjoying perfect health, is "carrying" a germ of the disease without becoming affected by it himself. Different people vary in the readiness with which they succumb to disease; this is known as susceptibility, and in the case of diphtheria, this degree of susceptibility can be found out by means of a test called the SCHICK REACTION. This test is dealt with fully under its own heading.

The Importance of the Membrane in Diphtheria.—The membrane in diphtheria is formed by changes in the tissues as they are killed by the activity of the growing germs. At first it is firmly attached to the back of the throat; and it is by the way the membrane is attached that the true diphtheria membrane can be distinguished from the membranes that are not due to diphtheria and can be pulled off the throat without causing any bleeding. In the worst cases of diphtheria the membrane becomes so extensive that the vocal cords are covered, and great difficulty in breathing is present and the patient will die unless an operation called *tracheotomy* is performed. Tracheotomy consists in making an opening in the front of the throat by means of which a tube can be passed into the windpipe to enable the patient to breathe.

The Antitoxin Treatment.—It needs little imagination to realize what a horrible disease diphtheria was in the old days when the formation of the membrane had to be allowed to run its course, and all that could be done was for some heroic and devoted person to attempt to suck the obstructing matter out of the throat. Fortunately, if the disease is taken in time, and nowadays it nearly always is, there is no need for it to be such a dreadful illness. The treatment by early injection of antitoxin has worked wonders. The subject of antitoxins need not be entered into here but is discussed under its own heading. The diphtheria antitoxin is now administered by the doctor as soon as he sees a case that looks as if it might be diphtheria, while at the same time, he takes a specimen of the matter at the back of the throat and sends it to a bacteriologist to be examined, to see if the special germ of diphtheria is amongst them. If the germs are present the treatment is continued, and if they are not, no harm is done. The reason for this haste is that the membrane grows with great rapidity, and the day, or even few hours, required for the examination of the specimen will make a great difference to the patient's chances of recovery. The importance of this early antitoxin treatment is shown by the fact, that nearly half of all the cases of diphtheria used to die, whereas nowadays, only eight or nine out of every hundred cases die, and these could be saved if they were treated in time.

Symptoms.—The period between the catching of the disease and the time when the symptoms first show themselves (the incubation period) varies from two to seven days: more usually two. At first the patient has the usual feverish symptoms of chilliness, fever, and aching pains in the back and limbs. The temperature does not usually rise above 102 degrees. A young child may have convulsions at the beginning. The

throat at first is only slightly sore and there is little difficulty in swallowing. The membrane usually appears first on the tonsils at the sides of the throat. Later, all the structures at the back of the throat, the tonsils, the uvula, the mucous membrane of the throat, all become swollen, and by the third day the membrane may have reached the back wall of the throat. The glands of the neck are usually swollen and tender. Gradually, in from seven to ten days, the throat becomes clear and convalescence begins.

General disturbance of health, due to the poisoning effect of the diphtheria germ, is usually slight when treatment is begun early; but when it is not the poisoning may be very severe and the heart affected, and death may ensue. These serious symptoms are more common when the throat infection is very severe. The glands become greatly enlarged, the patient becomes ashen-grey in colour, the pulse is rapid and later the temperature sinks below normal.

Nasal Diphtheria.—The disease can attack the nose in two ways. Either the passages of the nose become full of thick membranes but the disease remains very mild—this is called *membranous rhinitis*; or there may be true nasal diphtheria, which is very serious and the general symptoms are very grave.

Laryngeal Diphtheria.—This is described separately, as the narrow entrance to the air passages—the glottis—is affected, and this leads to hoarseness and difficulty in breathing. The attack begins with a slight hoarseness and a rough cough. After a day or so the child suddenly becomes worse, usually at night, and breathing becomes difficult. At first the difficulty only comes on at times, but later it becomes continuous. The colour gradually changes and the lips and finger-tips become livid. The child becomes restless and tosses vainly from side to side in his efforts to breathe. Occasionally, in a severe paroxysm, portions of membrane are coughed up. As a rule the fever is not marked, and the condition of the child is good at the beginning. In unfavourable cases the difficulty in breathing becomes more and more urgent, the blueness becomes more marked, and after a period of intense restlessness, the child sinks into a semi-conscious state, and death finally occurs from poison of the nerve centres. In these cases of laryngeal diphtheria the tonsils are usually covered with membrane as well.

Treatment.—Measures must be taken to prevent the spread of the malady. Diphtheria is best treated at hospitals; but if the patient remains at home, the room in which the patient is kept should be clear of carpets, curtains and superfluous furniture. The room must be kept warm (67 degrees F.) and well ventilated. A steam kettle is useful. Only the nurse, the child's mother and the doctor should visit the patient. The strictest quarantine should be employed against the other members of the household.

The local treatment is not so important now that antitoxin is used, but the mouth should be frequently rinsed out with glycerine of thymol or a weak boracic acid solution Nasal diphtheria requires prompt disinfection of the breathing passages, for which a very weak antiseptic solution is suitable.

When the voice-box is involved, a steam kettle is essential, and when there is obstruction the operation of *tracheotomy*, in which a tube is inserted into the wind pipe, must be performed; or intubation, in which a tube is inserted between the vocal cords, thus keeping them permanently apart. Hot applications to the neck are very comforting in the case of young children; in older children ice poultices may be found to be preferable.

Diet and General Treatment.—Food must be liquid such as milk, beef juice, barley water, ice-cream, soups, etc. If swallowing is too difficult, the fluid must be given in a tube. As much water as possible must be drunk, and the bowels must be kept open by means of a dose of calomel at night and salts in the morning. If the circulation fails it must be stimulated by drugs such as coramine or camphor, and an injection of salt solution into the bowel, which is allowed to remain there instead of being passed out again, is very useful.

Complications.—Bleeding from the nose or throat sometimes occurs in cases where there is ulceration, and *skin rashes* are sometimes present.

The *kidneys* may be damaged to some extent by the general poisoning of the system, and this is shown by the presence of albumin in the urine; this may also occur as a result of definite inflammation of the kidneys. Dropsy, however, is rare as a complication.

Paralysis.—This is the most important of all the complications. The poison appears to affect the nerves directly, and paralysis of some sort is present in about fifteen out of every hundred cases. It may occur after the mildest of cases; in fact some are so mild that the first thing which makes a patient realize that he has had diphtheria is when his tea suddenly comes back out of his nose, owing to paralysis of the muscles of the throat. This paralysis usually disappears after two or three weeks. Next to the throat the muscles of the eye are commonly affected, and this is shown by the development of a squint. Any nerve may be affected, and this will be shown by paralysis of the part supplied by the nerve.

Heart.—Serious heart symptoms in diphtheria are not common. The heart weakness is mostly due to degeneration of the heart muscle due to the poison of the disease.

Prevention of the Disease.—All cases of diphtheria must be notified to the medical officer of health, and the person suffering from diphtheria must be isolated. All clothing and everything that has been in contact with the patient must be disinfected. All cases with a mild sore throat must be carefully examined for the germ of diphtheria. The chief danger is not from a well-marked case, when these precautions are carried out, but from the milder forms which are not suspected.

Convalescence.—Because of the liability to serious complications, convalescence from diphtheria requires special care, particularly if the heart is affected, in which case absolute rest in bed for a long period will be necessary. If anæmia is present there must be plenty of nourishing food, and iron preparations should be given. In a certain number of cases there is paralysis of the throat after diphtheria, and in these cases the patients must be kept in bed and fed liberally. It may be necessary in these cases to pass a tube through the nose into the stomach for the purpose of feeding. In other cases there may be a great deal of muscular wasting and electrical treatments should be tried. No patient should be discharged from quarantine until the throat and nose have been found free from diphtheria germs on two examinations two days apart. This is because of the likelihood of the patient becoming a "carrier" and spreading the germs of this dangerous disease further.

DIPLEGIA.—By diplegia is meant paralysis on both sides of the body. This is a rare condition, as paralysis is usually one-sided. In children, however, it sometimes occurs as the result of injuries at birth. In such a case it will probably be present at birth and may get worse. The child will probably have to be treated at an orthopædic hospital or special children's hospital, where much can be done to overcome the difficulties it suffers from. (*See also* PARALYSIS.)

DIPLOPIA.—This is the medical name for the condition more commonly known as double vision. (*See also* DOUBLE VISION.)

DIPSOMANIA is a condition in which there is an intense craving for drink at intervals, leading to a drinking bout lasting a few days. During this time the patient is seldom sober. He is quite unable to resist the impulse to drink. After the bout is over, he returns to his normal life and remains without the slightest craving for alcohol until the craving suddenly returns after an interval and again he must drink wildly. Very often in between the bouts the patient not only takes no alcohol, but actually dislikes it. Before a bout is due the patient becomes miserable, very irritable and has sleepless nights. Then the craving for alcohol appears with rapidly increasing force. Nothing is known about the nature of dipsomania. It is quite different from the chronic drinking that results in delirium tremens, and perhaps has some relation to a mild type of true mental disorder.

DIRT EATING.—This is a peculiarity which may occur among people who are insane. They not only eat dirt, but all sorts of odd things such as lumps of coal, etc. Dirt eating is known technically as *pica*, from the Latin word meaning magpie. This peculiarity also occurs as a symptom in certain diseases; for example, chlorosis and ankylostomiasis.

Many children become infected with diseases because they have been allowed to put dirty fingers in their mouths or because they have eaten sweets or food that have dropped on the ground. In this way infection by thread-worms often occurs. Parents should be very particular to see that children wash their hands before a meal; by doing this, less germ-infected dirt will be eaten and the danger of disease will be lessened.

DISCHARGE.—The word discharge may be applied to many normal workings of the

body. For instance, sweat is discharged from the sweat glands, and urine is discharged from the bladder; but, as a rule, when we speak of discharges from the body we do not refer to these normal ones, but to others that appear from wounds or disease.

When we are suffering from a common cold, there is usually an increase of discharge from the nose and there may be a discharge of water from the eyes. Another kind of discharge is that which comes from an ulcer or some skin diseases. Wounds or fistulas may discharge pus as well as natural fluid. A wound in the cheek, for example, may reach to the salivary gland thus causing a discharge of saliva on the cheek, or a fistula in another situation may discharge bile or urine. Discharges may come from the vagina owing to disease or to internal disorders.

It should be remembered that most discharges are of an infective nature, so that dressings which are removed should be destroyed by burning. People suffering from a cold should be very careful with used handkerchiefs; they should soak them in an antiseptic solution. It is a very good thing to use soft paper handkerchiefs when suffering from a cold; in this way they can be burned immediately after use.

DISEASE.—Disease is commonly used to mean that one, or some, of the organs or systems of the body are not working properly. This may be because the part was ill-formed or deficient in some way from birth, in which case the disease is called *congenital.* Congenital diseases are also often *hereditary*, that is, they descend from generation to generation in the same family. A *constitutional* disease is one in which the whole body or the whole of one of the systems of the body is involved, such as anæmia. An *idiopathic* disease is one for which the cause is unknown, and a *venereal* disease is one which is due to sexual intercourse, usually promiscuous.

It is important to distinguish between actual disease and the natural reactions of the body. Disease should be treated with a view to curing and getting rid of it; but things that are sometimes symptoms of disease are also the body's natural reactions to unnatural states it finds itself in from time to time, and therefore must not be interrupted. For instance, a sneeze is a symptom of approaching influenza, which is a disease, and the sooner it is got rid of the better but a sneeze is also the body's way of getting rid of a piece of dust which has lodged on the mucous membrane or lining of the nose where it is not wanted. If one sneeze does not do the trick and get rid of the unwanted dust particle, a whole series of sneezes will follow until it is got rid of. The same is true of conditions like diarrhœa and sickness. In diarrhœa the bowel is trying to get rid quickly of something that is hurting it, and vomiting is the stomach's way of returning quickly something that is irritating it, but repeated sickness and diarrhœa over days or longer means that the irritating substance remains there or that disease has set in. These matters must be left to people's common sense to a certain extent. Everybody has seen a small area of inflammation or "gathering," say on a finger, which after a few days comes to a head and brings with it a small splinter or foreign body of some sort. Here the inflammation has been good and helpful; but everybody has also seen an equally small spot of inflammation which grows larger, gets red around the edges, throbs painfully, makes the temperature rise and the person feels worse each day. This is disease setting in.

Organic and Functional Disease.—The chief divisions of disease are mainly organic diseases and functional diseases. An organic disease is one in which some change has taken place in an organ whose working is upset, and the changes can be seen by the naked eye or by a microscope. A functional disease is one in which the working of the organ is upset but nothing can be seen to account for it. An ulcer of the lining of the stomach is an organic disease, but for some reason the stomach may be producing a different sort of gastric juice and therefore not be working well, and this is functional disease of the stomach. Long-continued functional disease of an organ is very likely to cause organic disease of that or some other organ, so it is just as important to treat the functional disease as the organic. Unfortunately it is not so easy, as the cause of the functional disease is not obvious and may be in some distant part such as the glands or the part of the brain dealing with the nervous system, and even then it may only be some general fatigue or weakness of these regions.

Causes of Disease.—The causes of disease are manifold. First there are congenital

diseases and hereditary diseases. Of diseases acquired later, the commonest cause is the entry into the body of germs which become too powerful for the bodily defences to deal with. Poisons which are produced by the body itself and are called toxins or which enter the body from without, are the next commonest causes. Strain—either physical, where the body or some part of it is always being overworked, or mental, where the mind becomes fatigued through overwork or worry—leaves the body in not such a strong state to hold its own against infection and poisoning. Excessive cold and starvation, also extreme heat and overeating on the other hand, cause disease. Physical violence, either in the form of accident or otherwise, can be the starting-point of disease by impairing the working of some organ.

Occupational Diseases.—By occupational diseases we mean diseases which would not have been contracted by the individual if he had not been following that particular trade or occupation. In some occupations there is a definite danger from certain diseases as, for instance, lead-poisoning amongst painters, anthracosis or silicosis amongst coal miners, a certain sort of cancer amongst cotton-spinners, etc. These are dealt with again under the heading OCCUPATIONAL DISEASE.

DISINFECTANT.—Any substance which is able to kill the germs of disease is known as a disinfectant. Many people refer to antiseptics as disinfectants, but an antiseptic does not kill germs—it is used to prevent their growth. When treating a wound, an antiseptic is used to keep the wound clean and to prevent the growth of any germs, but when germs are actually present, such as in many infectious diseases, it is necessary to use a disinfectant in order to destroy them. The clothes used by the patient and all utensils used in the sick-room should be thoroughly disinfected. *See* following article on DISINFECTION.

There are many well-known disinfectants which can be relied upon to act properly if they are used in sufficient strength for whichever purpose they are required. Among the more common disinfectants are carbolic acid, creolin, lysol, naphthol, formaldehyde, chlorine and potassium permanganate.

DISINFECTION.—By the word "infection" we mean something catching, like influenza, or mumps, or smallpox—something that goes through the house, the school, the office, so that one after another goes down with it till it has run its course. But possibly not so many people would go down with an *infection* if everyone used common sense about *disinfection.*

Disinfection means Cleanliness.—To disinfect, then, is to keep clean, either as a preventive or, after the germ has entered, to keep it from spreading the mischief to someone else.

Every mother of a young family should keep simple disinfectants ready, and not allow a cut, a burn or a scratch to be hastily dabbed with a dirty pocket-handkerchief or rag, but carefully wash it with a little boracic acid or iodine, and then bind it up in clean lint and bandage it. First-aid in simple cases is now within the reach of everyone, and there is no excuse for ignorance of the dangers of a dirty wound. Then care about articles of the toilet is most important, such as tooth-brushes, nail-brushes, sponges and towels.

The most powerful Disinfectant.—Apart altogether from any of the ordinary chemical disinfectants, the most powerful disinfectant we have is sunlight. It is well for us that not many germs can live in sunlight even for an hour. So let us have as much sunlight in our houses as we can! Isn't health better than a carpet that still looks as if it had just come from the shop because we have been so careful to draw the blinds to prevent it from fading? So open up the windows, let in as much sunshine as there is and, in any case, plenty of fresh air.

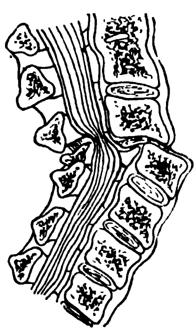
Disinfection of a Room.—To disinfect a room after it has been occupied by a person suffering from infectious disease, it is necessary to see that the vapour of the disinfectant used shall penetrate to every nook or cranny, because no crack is too small for germs to lodge in and start breeding. Take all pictures off the wall and put singly in a sloping position against the wall. Open and take out all drawers. All clothing and hangings, bedding, etc., should be "stoved." Paste thick paper over joins in the window-frames and keyhole. Close the register of the fireplace, and stuff any cracks there may be in the chimney with straw. Sprinkle water over the floor and walls to make the atmosphere damp, then set the fumigator in the middle of the room, or if it is a large room

use several fumigators. Take care that there is a fireproof plate of some sort under the fumigator. If sulphur is to be used put the sticks of sulphur, broken up into small bits, on a tray laid over a large dish of water. Light the fumigator of sulphur and as soon as you are sure they are burning retire from the room and close the door. When the door has been closed upon the burning disinfectant, remember to put something along the foot of the door on the outside and close up all cracks through which the vapour could escape. Leave the room thus for twenty-four hours, then unseal the room, and open all the windows. It is better to leave the room for another day before cleaning it thoroughly.

In the case of infectious disease, advice and help in disinfecting will be given by the sanitary officer if asked. (*See also* ANTISEPTICS; DISINFECTANT; INFECTIOUS DISEASE.)

DISLOCATION.—Dislocation usually refers to the displacement of a joint from its natural position. This may be caused by injury to the bones and ligaments which keep the joint in position, or it may be due to disease. Tuberculosis, for instance, is a disease in which the ligaments and bones may be gradually worn away, thus giving rise to dislocation. In some cases the bones may never have developed at birth, and so when any strain is put upon them, dislocation takes place.

Like fractures, there are two types of dislocation, simple and compound. In the first type there is nothing but a straightforward dislocation, while in the second the skin is broken and a part of the bone may protrude through. Surgeons usually divide dislocations into two classes: (1) congenital, which means present at birth, or (2) acquired later in life as the result of an accident.



Dislocation of Spine, showing compression of Spinal Cord

The parts of the body which are most liable to become dislocated are the shoulder, the hip, the jaw, the knee-cap, the finger-joints and the elbow. The jaw may be dislocated as the result of a blow, or it may occur after a yawn. The collar-bone or shoulder-blade is very commonly put out as the result of a fall from a horse, and so on.

Once a joint has been dislocated, it is very apt to slip out again, and it is not unusual for a person to become quite expert at readjusting his own particular dislocation; but this should not be tried on another person by any unskilled person.

Symptoms.—The symptoms of a dislocation are loss of movement of the particular joint, but much depends on the type of dislocation which takes place. As a rule, it will be found that when the injured limb is compared with the normal one, there is some difference in length. Sometimes shortening takes place, while in other cases the limb may have lengthened. There may be some pain and swelling around the joint, especially if the dislocated bone is pressing on some nerve.

Treatment.—Immediate treatment consists of applying cold water cloths to the part in order to relieve the pain, and absolute rest is necessary until the proper medical advice can be obtained. It is unwise for an unskilled person to attempt to put the dislocated bone back into place, as great damage may be done by tearing nerves and vessels. After the limb has been adjusted to its normal position, care must be taken in using it.

DISPLACEMENT.—Displacement of various organs of the body often occurs through injury or disease or, in some cases, the bones of the body may become displaced through the habit of standing and walking badly. The stomach may become displaced owing to weakness of the muscles, and the kidneys may be very movable and descend lower than they should be normally.

One reads a good deal nowadays about displacement of vertebræ in tennis players and others, but such displacements usually exist only in the imaginations of the medically unqualified specialists who take a special interest in the spinal column and its alleged ailments.

Displacement of the womb is a very common complaint in women, especially in women who have had children. This condition can be corrected by operation, or relief can be had by wearing a special belt. (*See also* ABDOMINAL BELT; CORSETS).

DISSEMINATED SCLEROSIS is a very common disease of the nervous system, and

certainly the most common one in people between the ages of twenty and thirty five. The exact cause is still unknown, but what occurs is a scattering of patches of changed nervous tissue throughout the brain and spinal cord. Although the fatty coverings of the essential parts of the nervous tissue in these patches are destroyed, and their place taken by a firm supporting tissue, the vital part of the nervous elements survives for a long time after the destruction of its fatty coverings, and so the course of the disease is, in general, a long one. The changes in these patches of nervous tissue do not all take place at one and the same time; first one patch is attacked, and then another, so that the symptoms from which the patient suffers depend, practically by chance, on whichever part of the nervous system is first stricken.

In actual practice, however, it is found that certain parts tend to be involved with a remarkable regularity. The earliest effects of the disease which take the patient to the doctor are very often seen in the eyes. A very large number of patients with this disease complain first of rapid loss of vision in one eye. This may produce complete blindness in that eye for a short time, but it is good to be able to reassure such a patient that the vision will return, in nearly every case to normal, within a few weeks. The incident of the loss of vision in one eye often occurs years—even as many as twenty years—before any other signs or symptoms of disseminated sclerosis appear, and very often the patient, when seen with the fully developed picture of the disease, has completely forgotten that such an incident ever happened. Similarly, a patient may for a short time see two things instead of one, years before the apparent onset of the disease, and may forget the incident, but the double vision is part and parcel of the disorder.

Other early incidents (the word "incidents" best describes these symptoms, because they are fleeting, a feature which is almost peculiar to this disease) are sudden loss of power in a limb, which power returns within a week or a fortnight; sudden attacks of numbness and tingling in an arm which lasts for a week or so and then disappears; prolonged attacks of giddiness or vomiting, for which no ascertainable cause is present; any of these may be one of the modes of onset of disseminated sclerosis. When the disease is advancing, stiffness of the legs and difficulty in walking become noticeable. This stiffness varies from time to time; it may be so severe one month that the patient is forced to keep his bed, but within a month he may be walking again. This variation in severity is one of the chief characteristics of the disorder. The speech becomes altered, and the patient begins to speak in a jerking, "staccato" manner, but this type of speech is only heard in advanced cases. Most victims of this disease develop a trembling of the arms, which is most marked on movement towards an object, and is often noticed first in performing such fine movements as threading a needle. This trembling increases as the disease advances. The mental outlook of the patient is fortunately a happy one. The patient with disseminated sclerosis is surprisingly cheerful; even when unable to walk, he does not seem to suffer mentally. A frequent and favourite expression of these patients is "Well, what's the use of being anything else but cheerful, doctor?" Although periods of improvement lasting sometimes for many years occur, the disease must be said to be a hopeless one, inasmuch as it cannot be cured. The periods of improvement may be so long, however, that a patient may go for ten or fifteen years between his attacks. The only treatment which assists in improving the patient's condition is arsenic, and this is given as a matter of routine in every case. Where there is much stiffness of the limbs, massage is of great service. Patients with disseminated sclerosis should avoid over-exertion, but should not stay in bed as long as walking is possible. The vaccine treatment which was hailed as a cure for this disease is now discredited; it has recently been suggested that the disease may be due to some lack of vitamins, but this has yet to be proved.

DISTENSION.—It is not unusual for the stomach to become distended or blown out with food and with gases, or for the bladder to become distended with the presence of too much urine. As a rule, these states of distension do not last for very long, and they can be relieved quite quickly. Should distension of the stomach or any other organ become a chronic state, it would be advisable to consult the doctor, especially where there is any feeling of discomfort.

DISTILLED WATER.—To make distilled water, ordinary tap water is heated and the vapour is collected drop by drop as it condenses. Distilled water is used if any chemically pure substance is required; for example, a chemist always uses distilled water for doing accurate scientific work. It is rather unpleasant to drink, as it has a flat, mawkish taste; but either boiled or distilled water is used a great deal in the East.

DISTRICT NURSES.—District nurses are a highly trained body of nurses who are able to provide skilled attention by daily visits to patients who are unable to afford a permanent nurse or who are unable to go to hospital. The district nursing system was founded in commemoration of Queen Victoria's Diamond Jubilee. A district nurse, or Queen's nurse, as they are called, usually visits each patient twice a day. She takes temperature and pulse and makes notes regarding the condition of the patient. She washes the patient, or gives a bed-bath if necessary, and makes the bed; but it is not within her province to do any cookery or housework. Anyone requiring the services of a district nurse should find out the address of the local nurse, or write to the General Superintendent, Queen Victoria's Jubilee Institute for Nurses, 58 Victoria Street, London, S.W.1. But the doctor in attendance will usually tell the patient when a nurse is necessary and give the nurse her instructions.

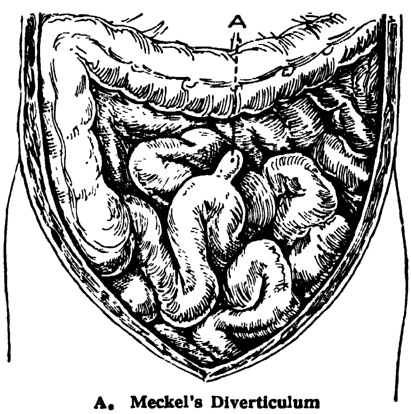
DIURETIC.—A diuretic is a drug which has the power of increasing the flow of urine from the kidneys. In certain diseases where the usual output of urine is very much below normal, it is necessary to give diuretics to encourage the flow of urine. When the urine has not been able to leave the kidneys it becomes concentrated and unhealthy, and as a result the body becomes poisoned by the waste materials which are normally got rid of in the urine.

Diuretics act upon the kidneys in various ways. Some raise the blood pressure and cause an increased flow in the blood-vessels and nerves, others act by narrowing the blood-vessels, thus causing internal pressure. The blood-vessels also narrow when the body is feeling cold, thereby causing an increase of the flow of urine. Many people experience this annoying symptom when they are suffering from a slight cold or when they are out on a cold day and begin to feel chilly.

Water is one of the best diuretics if only a mild stimulant to the kidneys is required. Many people do not drink sufficient water during the day to allow the kidneys to be well flushed out. Of course, if the kidneys are diseased, more complicated measures have to be taken and diuretics should be given with great caution and only under medical care.

Caffeine, which is contained in coffee and tea, is a good diuretic and it is especially valuable in heart diseases where there is an excess of water in the body (dropsy). Theobromine is a more powerful diuretic and it is not so likely to keep the patient awake as caffeine. It may be given in cachets in doses of 1 to 5 grains.

DIVERTICULITIS.—A diverticulum is a blind pocket which sometimes forms in the walls of the soft organs of the body such as



A. Meckel's Diverticulum

the large bowel (colon) or bladder. These pockets or pouches are quite common and in a great many cases give rise to no discomfort or symptoms of any sort. Occasionally, however, they may get inflamed through the collection in them of waste materials, and this inflammation may give rise to symptoms and is called diverticulitis. This may be serious enough to require an operation. (*See also* INTESTINES.)

DIZZINESS.—Dizziness in itself is not a disease, but it may be a sign that the body requires overhauling. There are so many different ways in which dizziness might be caused that it would be difficult to give more than a few here.

When a person is feeling bilious it is not unusual for him to feel dizzy just before

sickness begins, and the feeling generally goes when the biliousness disappears. Over-smoking may cause slight dizziness, and certainly indulgence in too much alcohol causes the head to go round. Some people cannot stand on heights without feeling dizzy, while others feel dizzy at the thought of going on board a ship. Certain forms of heart disease may cause dizziness, and sometimes inflammation of the ears may be the cause.

In the majority of cases it is advisable to keep the bowels open and to eat nothing but the most simple forms of food. Alcohol and tobacco should be cut down or, better still, avoided altogether. If the dizziness does not go, it is a sign that something is wrong and the doctor should be consulted. (*See also* VERTIGO.)

DOG BITE.—*See* BITES and HYDROPHOBIA.

DORSAL.—Dorsal is the adjective applied to the back. The word is also used in connection with the back of any other part of the body. For example, the back of the hand is the dorsal part of the hand, and so on.

DOUBLE VISION.—The ordinary act of seeing, which takes place whenever we look at anything, is the result of the two eyes working exactly together. It happens in certain diseases, and sometimes as a result of alcoholic excesses, that when one thing is looked at, two images of it are seen, that is, each eye has its own vision of the object and the two are not yielded into one image as they are in healthy sight. This condition is called double vision or diplopia. (*See also* DISSEMINATED SCLEROSIS; ENCEPHALITIS LETHARGICA.)

DOUCHE.—A douche is an application of a stream of water to the whole or part of the body. It may be applied outwardly in the form of a jet or jets of water as in the Vichy douche and Aix douche, so called after the two famous spas, or inwardly into various cavities of the body such as the ears, nose and vagina. The external douches are mostly used together with massage for chronic diseases of the joints and muscles, and to stimulate the flow of sweat.

Internal douching is used for purposes of cleanliness and disinfection and to relieve congestion in the neighbourhood of the part which is douched. Of these douches the most generally employed is the vaginal douche for conditions in which there is a discharge or where the organs are congested and painful. These douches should be used at a fairly hot temperature, 100 degrees being about right. A tepid douche may give rise to a chill and so do more harm than good. The disinfectant used should be very weak, as the purpose of the douche is rather to wash away germs and the mucus which is always present in inflamed conditions, than to kill the germs; and with an antiseptic that may be strong enough to injure the delicate tissues lining the vagina or nose as the case may be. The Plombières douche is a means of washing out the large bowel, and is very useful in such conditions as colitis. The stomach and bladder can also be washed out, and also the womb, but these can only be done by trained experts.

DOUCHE CAN.—The can used for ordinary douches is usually of glass or more often white enamel, and holds two to three pints of fluid. It is open at the top, and at the bottom has an outlet to which a tube can be attached. The length of the rubber tubing used will, of course, vary with the distance that the fluid will have to flow. When buying tubing, at least three yards should be bought, then the can may be used in different rooms and places if required. Different nozzles are used according to what part is to be douched, and if there is no tap on the nozzle for turning off the flow of fluid a clip of some sort should be provided to clip on the tubing when required to stop the flow. In an emergency a clothes-pin will do.

All apparatus should be kept perfectly clean, and if used by different people must be boiled well between times.

DOVER'S POWDER.—A powder which contains ten per cent. each of opium and ipecacuanha. It was first introduced by an English physician named Thomas Dover, who lived between the years of 1660–1742. This powder has always been a very popular one, and it is much used as a remedy for a common cold, or when there are symptoms of bronchitis. The ipecacuanha is very soothing to the inflamed surfaces of the throat, and the opium induces a sound sleep and is ideal for stopping a dry, irritating cough. The combination of opium and ipecacuanha also induces the patient to sweat, which is very helpful in getting rid of poisonous matters in the system. Because of the large amount of opium it contains, a doctor's prescription is

usually necessary in order to have it made up at a chemist's.

DREAMS.—These are more than vivid experiences we have whilst we are asleep. They bear a definite relationship, often obscure, but always to be found, to our waking lives. In childhood, dreams are simple and uncomplicated; what the child wishes or longs for whilst he is awake he obtains during his dreams. Lonely only children often dream that they have many brothers and sisters; a realization in their dreams of the companionship they long for during the daytime. The child's mind is like a canvas on which certain impressions from the world it lives in are painted. These impressions are stored up, and if they are unpleasant ones they may be forgotten in the sense that they are not remembered when adult life is reached, but the impressions are there and may appear in dreams.

If the meaning of such dreams is not clear at first, by carrying the mind back to incidents which may have occurred in childhood the meaning may suddenly dawn on the dreamer. Here is an example: a man dreamt that he was watching a funeral procession; as in most dreams, he felt no emotion, but was merely interested. Even when he realized that the funeral was that of the late Queen Alexandra, he felt no sorrow, but took off his hat because he saw other spectators doing likewise. When this dream was related by the dreamer, he was asked who the late Queen reminded him of. Immediately he said "My mother!" He then said, "Oh, but how awful to think of my mother dying!" (His mother was alive and well, and he was devoted to her.) But subsequently it turned out that as a child he had been a "Mother's darling," and had secretly wished that his mother could somehow be removed so that he might have some freedom like other boys. A few days before the dream he had read a discussion in the paper on the value of learning self-reliance in youth, and his old secret resentment at having been deprived of this through excessive mother-love had caused the "death dream." Because it would have been too painful for him to have consciously wished for his mother's death, even in a dream, the mother was represented by the late Queen, a Queen being to her people what a mother is to her family. There is always a central idea in a dream which conceals an unexpressed or forgotten wish on the part of the dreamer. But because this wish is often of an unpleasant or anti-social character it is "wrapped up," so to speak; the central idea becomes a framework, on which the dream as experienced and related by the dreamer is built up. In trying to find the real meaning of a dream, it is necessary to take it to pieces, bit by bit, and gradually work back till we find the central idea, which is usually something that the dreamer does not like to face in his actual waking life.

One of the most interesting things about dreams is that nothing we do in them seems absurd. We journey round the world, we fly without wings or any other obvious means of transport, we appear to converse with famous historical characters long since dead, and in our dreams these things seem perfectly right and natural. Very often a dream forms a continuous story or drama, but it is seldom as clear-cut as, for instance, a story that we tell or read. Thus, a dream-scene may be a mix-up of many known places, and a dream-person may be built up out of the features, characteristic mannerisms and personal peculiarities of many known persons. This mix-up takes place in order that the central idea of the dream, which we unconsciously wish to conceal, may be disguised. Only when we "take the dream to pieces" do we begin to recognize the meaning of it.

DROITWICH.—A small spa town in Worcestershire, about twenty miles from Birmingham, the feature of which is the strong natural brine springs. Recent developments tend in the direction of making Droitwich more efficient as a spa and better known than formerly, and this is as it should be, for the salt waters of Droitwich are stronger than any other water in Europe, containing 31 per cent. of common salt. The brine is so strong that it cannot be drunk, and the chief method of treatment employed at Droitwich is that of immersion baths. It is impossible to sink in the swimming-baths at Droitwich, owing to the great density of the water. This allows of unique opportunities of exercising limbs affected by rheumatism. By passing gas into the diluted natural water, effervescent and aerated baths are produced, useful in heart affections and neurasthenia. But rheumatism in

different forms is the chief disease treated at Droitwich. (*See also* BATH.)

DROOPING EYELID, or PTOSIS.—This is the name given to an abnormal drooping of the upper eyelid, caused by some deficiency in the muscle which raises the upper eyelid.

Congenital Ptosis, which is due to some error in development, may be due to absence or paralysis of the muscle. It may be on one side only, but is generally on both; and may be found in several members of the same family. There may be other faults in the eye muscles as well as the drooping, of which the most common is inability to move the eye itself upwards.

A person afflicted with drooping eyelids wrinkles up his brow and raises the eyebrows and carries his head as far back as possible. The condition is readily diagnosed by the marked contrast between the wrinkled anxious brow and the calm drooping eyelid, Where the eyelids have drooped from birth, operative treatment is the only way to give relief.

"Jaw-winking" is the name given to a curious variation on natural ptosis. In this the patient droops the eyelid *except* when he is moving his jaw. It is due to an "error in the coupling up of the nerve supply to the various muscles," and cannot be remedied.

Drooping eyelids which only droop later in life are due to very many causes, tubercular paralysis of one or more of the eye muscles being the most common in childhood, and syphilitic paralysis, locomotor ataxia, tumour or other diseases of the brain being the most common in adult life. It may occur also after some infectious fevers; shingles; certain poisons; and in neurasthenia, where there is weakness, but not actual paralysis, of the muscle.

There is a form occurring usually in delicate women of middle-age; it is most marked in the morning, and gradually improves as the day goes on. It is probably due to debility, as it passes off when the system is toned up.

Treatment.—The primary treatment of drooping eyelids, other than the congenital type, is that of the cause; until this has been done nothing further should be attempted. If, however, it is found to be incurable by ordinary means, an operation is performed. There are several methods, all of which have their adherents, but the principle in all is not completely to *cure* the ptosis. When this is done, i.e. if the condition is so altered that the patient's eye is wide open when he is awake, the lid will not close completely during sleep, and the sight would sooner or later be damaged or destroyed by excessive exposure to the light. Hence what is aimed at is to *improve* the condition, but not to raise the lid so high that it cannot be lowered easily and completely.

Senile ptosis occurs as a normal condition to a slight degree, in old age; it is caused by gradual diminution of the fatty tissue at the back of the eye, and a consequent falling back of the eyeball into its socket. A more marked form is sometimes seen. These cases need not be treated.

"**False ptosis**" is the term given to drooping of the eyelids from other causes than that of paralysis of the muscle. In cases of the serious eye disease called trachoma, for instance, the patient "gets into the habit" of keeping the lid half-closed, to avoid the discomfort of moving the roughened granular surface over the eye. As, too, the lid is thickened and stiffened by the disease, it is all the more difficult to raise. In cases of eye disease, where light is painful to the eye, the patient again gets into the habit of keeping the eyelid down to protect the eye. This habit continues for a long time afterwards, and may be most difficult to "cure"; but the condition is not a true ptosis.

DROPSY.—Dropsy is the name given to an unusually watery state of the tissues of the body. In every healthy person there is a certain amount of leakage of the watery part of the blood into the flesh, but when dropsy occurs, this normal state is very much exaggerated. The fluid part of the blood is controlled by a complicated system of tiny vessels known as the lymphatics, and if obstruction takes place in any of these vessels it is obvious that swelling is bound to appear, and the larger the vessel the larger the amount of swelling or dropsy will occur. Another cause of swelling is too great a flow of fluid out of the blood-vessels, in which case the lymphatics are not able to pass it along quickly enough, and dropsy takes place.

Dropsy a Symptom, not a Disease.—There are very many causes of the state of dropsy in the body, and it is not a disease in itself, as

many people seem to think, but merely a sign that something is wrong in the body somewhere. There are also various forms of this condition, which may range from a small swelling caused by a bee sting, to the great swellings which cover the whole of the body; but both states are true dropsies, the only difference being the quantity of swelling. In the case of a bee sting, the poison causes the blood-vessels to open more widely than usual, and a greater amount of fluid is poured out into the skin, thus causing a swelling (or dropsy) to appear over the place stung.

Again, many other conditions cause the blood-vessels to open, and it is natural to suppose that the more poisoned the vessels become, the greater will be the amount of swelling. Many people who suffer from rheumatism find that they swell up very easily, and it is thought to be due to poisons in the system. In very hot weather it is not unusual for the hands and feet to swell up; this is caused by an extra flow of fluid from the blood-vessels which the lymphatic glands are not able to carry away at once.

Dropsies of Heart and Kidney Disease.—In certain diseases of the heart, dropsy occurs all over the body. Some of the worst forms of dropsy belong to this form of heart disease. There are several explanations for this excessive watery state of the body, but there is no doubt that blocking of the blood-vessels, and also of the lymphatic vessels, owing to the inability of the weakened heart to do its usual pumping of the blood, may cause this excessive swelling to take place. It is no unusual thing for a person to become intensely dropsical owing to heart disease, and when the heart condition is restored to normal, the swellings may disappear within a few days.

The dropsy caused by disease of the kidneys is not so severe as that caused by heart disease, and it seems to appear in certain parts of the body instead of all over. The legs very often become swollen, and the face, especially the eyelids, is largely affected.

Treatment.—The same treatment will obviously not apply to all cases of dropsy. The cause of the condition will have to be taken into consideration, but the dropsy itself may be so distressing as to require special treatment apart from the disease which is causing it. For the slighter degrees of dropsy no special treatment need be given beyond treating the cause of the condition. Once the cause is removed, the dropsy will naturally disappear.

When the dropsy is due to heart disease, complete rest in bed is absolutely necessary, and such drugs as digitalis or salyrgan, which tend to increase the flow of urine, are usually given. The diet is generally kept as dry as possible and very little salt should be allowed.

The treatment of the dropsy caused by disease of the kidneys is usually the same as the disease. (*See also* NEPHRITIS.) Some of the excess fluid may be taken off by the operation of tapping, and this may require to be done repeatedly. It is not advisable to give drugs which increase the flow of urine when the kidneys are diseased, as this may set up irritation and aggravate the condition.

The general treatment of dropsy depends on the cause, and a doctor should be consulted without delay in order that the cause may be discovered, as far-reaching consequences may result if the condition is neglected.

DROWNING.—At some time or other most of us will come in contact with drowning, or at any rate with accidents on the water. A person taken from the water, even though he may have been in some time, is not necessarily dead, and although there may be no sign of life, it is the duty of those around to endeavour for at least two hours to restore life. The means used will be found in the articles on FIRST AID and ARTIFICIAL RESPIRATION. After the emergency measures have been carried out and the person has begun to come round, he may be given hot tea or coffee or sal volatile to safeguard against sudden collapse. He should be put to bed with hot-water bottles and kept warm and quiet in a darkened room until he has had a good sleep. (*See also* ARTIFICIAL RESPIRATION; ASPHYXIA; FIRST AID.)

DROWSINESS.—Drowsiness is a natural state when we are feeling tired, and it is not unusual for people to feel drowsy on a hot day after they have eaten a heavy meal. In normally healthy people the feeling of drowsiness should only be there for a short time before going off to sleep, but there are some people who feel drowsy during the day when the mind should be feeling fresh and active. This feeling may be brought about by indigestion, or it may be caused by

poisons in the system. Living in a badly ventilated room will cause a feeling of heaviness and drowsiness because the body is gradually being poisoned through lack of fresh air. One of the great dangers of taking too much alcohol is the feeling of drowsiness which follows; many people have died through lying down to sleep in the cold and wet. Extreme cold also brings on a feeling of drowsiness. Arctic explorers tell how they have often had to fight against the feeling of drowsiness because to give way to the feeling would mean certain death.

Unusual drowsiness should be looked upon as a sign that the bodily health requires seeing to, and measures should be taken to find out the cause; in other words, a doctor should be consulted. (*See also* COMA.)

DRUGS.—Drugs are substances which are used to help the body to fight against disease, or which help the body to carry out its normal work. Many people are afraid to use drugs because they say they are unnatural and dangerous; but they forget that disease is just as "unnatural," and the knowledge of drugs which has come down to us through the ages should be looked upon as an important advancement towards the happiness and well-being of mankind. Certainly it is wrong to indulge in drugs when the body is in a perfectly healthy state, and it may cause serious damage to do so, but there are many cases where the administration of the right drug at the right time may save a great deal of needless pain and worry.

The number of drugs which are in everyday use are very many indeed, and not a few of our most useful ones were discovered in the olden days by herbalists, and a good many have come to us from native tribes in foreign countries. It is a comfort to us to know that when we are given medicine to take, the doctor is almost certain of the result it is going to have on us. Modern science has done much towards finding out the exact drug to use in each disease. It is not so very long ago since drugs were given in a very hit or miss fashion, and the doctor was never quite certain if his patient was going to be killed or cured. There is no doubt that many useless and, at times, harmful drugs must have been given through ignorance; but nowadays, with our medical laboratories and experienced chemists, there is every hope that all diseases may be successfully treated by means of drugs, and all unnecessary pain done away with.

Drugs are obtained from several sources; some come from plants, some are obtained from minerals, while others are extracted from animals. Many important and rare drugs are now able to be made up artificially in a laboratory; these are termed *synthetic* drugs and they are just as effective as the drugs obtained from their original source. A good example of this is salicin, which used to be extracted from the bark of willows and poplars; but is no longer used because sodium salicylate, from which aspirin is made, is now manufactured artificially.

Drugs from Common Plants.—The majority of drugs are obtained from plants, and many of our most important preparations are got from flowers and trees grown in our meadows and hedgerows. The common foxglove gives us a most valuable and widely used substance from its leaves, known as digitalis, which is used in the treatment of diseases of the heart. Extracts from the British fern, which is to be found growing in almost every wood, is one of the best cures for tapeworm. The meadow saffron gives us a drug known as colchicum, which relieves the pain in gout in the most remarkable way.

The plant known as deadly nightshade is still quite a common one and may be found growing on our English downs. From it many preparations of belladonna are made, and atropine, which is a valuable drug in the examination and treatment of the eye, is also obtained.

Diuretics (drugs which are given to increase the flow of urine) are obtained from broom and from juniper. Creosote, which is used as an antiseptic and as an inhalant in bronchitis, is obtained from beech trees. Oil of rosemary is distilled from the flowering tops of the rosemary plant, and it is commonly used to give a pleasant scent to hair lotions and other preparations.

The leaves of the henbane, collected from the flowering plant and dried, give us a drug known as hyoscine, which is a powerful narcotic; it is often used to soothe people who are suffering from delirium tremens or insanity.

Aconite is prepared from the root of the monkshood plant, but this drug is now used very little, as it appears to be only of use when used in dangerously large doses. At

one time it was exceedingly popular as a remedy for fevers.

So far all the plants mentioned are British, but there are also a large number of drugs obtained from foreign plants which are imported into this country. Castor oil comes to us from the castor oil plant grown in India; jalap is grown in South America; opium, from which very many important preparations are made, is obtained from the opium poppy cultivated in the East. Rhubarb root is grown in China and Tibet, and it is commonly given to children as a purgative; cascara sagrada is another useful purgative which is prepared from the dried bark of the Californian buckthorn. These are but a few of the enormous number of drugs obtained from foreign plants, and most of the more important ones will be found under their own headings throughout this book.

Many mineral substances, such as iron, arsenic, radium, mercury, copper and lead, from which drugs are obtained, are found in this country, but most of our supplies are obtained from abroad. Coal deposits, which are the remains of our ancient forests, give us some disinfectants such as carbolic acid, etc., and many important aniline dyes. The sulphur springs of Harrogate to which many people go for treatment are the best ones of their kind, and there are also several places throughout the country that are rich in mineral waters containing iron, radium and magnesium sulphate (Epsom salts).

Extracts from the glands of various animals now supply us with some of our most valuable drugs. From the pituitary gland, which is situated at the base of the brain, we are able to obtain pituitrin. This drug is used a great deal in heart failure and it is able to act within a minute or two of injection.

An extract is also obtained from the thyroid gland in the neck which is able to cure cretinism in children. These children, by taking regular doses of thyroid extract, are saved from being dwarfs and imbeciles.

Insulin, which is obtained from the pancreas of sheep and oxen, is of great use in the treatment of diabetes. The patient will find he is able to make food almost immediately after treatment by this drug, but as insulin does not cure diabetes, the treatment must be carried on all the time.

The supra-renal glands, which lie above the kidneys, also supply us with a principle which is used in medicine.

No doubt one often hears of the active principle of a drug. This means the actual part which is able to produce an effect on the body. Many drugs are in a *crude* state, which means that they are not pure, but are mixed up with other substances. Chemists have now found means by which they can separate in a pure state the active principle of a drug from a crude preparation. In this way the treatment of a disease is made safe and efficient because the doctor is able to tell just how much active principle of a drug is good for his patient. Therefore, the part of a drug which is able to produce a definite result on the body, and which has been separated from all other substances, is known as an *active principle.*

Valuable Properties of Certain Drugs.—Many of our most useful drugs owe their value to the presence of a property which is known as an alkaloid. Drugs such as morphine, quinine, atropine and strychnine all contain alkaloids and all are obtained from plants.

Glucosides are properties which, when acted upon by other substances, give off either sugar or alcohol.

Fixed oils formed from the fatty acids in drugs and fats are oils which are solid at ordinary temperatures. Waxes are chiefly made of fatty acids combined with alcohols.

Volatile oils are thick oils which do not leave a greasy mark on paper; they are usually prepared by distillation. Gums are extracted from the stems of trees and plants.

Vitamins are properties which chemists have not yet been able to separate into a pure state, but they are most essential to our diet and are to be found in various forms of food.

Vaccines, serums and antitoxins may be described as drugs which are used to protect the body against disease.

Drug Habits.—The habit of taking drugs regularly is a very widespread one, but such substances as tobacco and tea, coffee, etc., are harmless if not taken to excess. The drugs which have the most harmful effect upon people are such as cocaine and morphia, and once these drugs get a hold on their victims, the habit of taking them can only be broken off with difficulty.

The habit of smoking tobacco is one which the majority of people all over the

world indulge in, and it can be a very pleasant and soothing habit, if kept within suitable limits. Like everything else, one person may be able to stand more than another, and it is a matter of experience to find out one's own limit. If indulged in to excess, it causes indigestion, irritability and sleeplessness. Prolonged excessive smoking may lead to blindness. (*See also* BLINDNESS, TOBACCO.)

Caffeine, which is found in tea and coffee, is very stimulating, but excessive tea-drinking may cause indigestion, probably due to the tannin in the tea.

Opium and its derivative, morphia, can be taken by eating it, by smoking and so inhaling it, or by injecting solutions of it under the skin. The type of person who eventually becomes a morphia victim is usually temperamental, but there are often circumstances which lead up to the taking of drugs which one would find it very hard to condemn. It is not unusual for patients who are suffering from a prolonged and painful illness to find refuge in drugs; and such a habit pleads its own defence. But there are certain people who take morphia purely for the delight it gives them. These people mostly include the wealthy devotees who have taken to it through sheer boredom and probably because they have no occupation to interest them. Others who take to morphia are of the degenerate type to whom excess in alcohol or any other similar drug seems to be natural and inevitable.

The result of taking cocaine is even more disastrous than that of taking morphia, and one of the most unfortunate things about the cocaine taker is his ignorance of his state. As a rule, those who take morphia in their normal moments, realize that they are victims of the drug habit, but the habitual cocaine taker usually becomes too affected to realize his condition.

Cocaine at first relieves fatigue and this is followed by a delightful sense of vigour and mental well-being. But in the course of time the habitual taker of "snow," as it is called, suffers from many mental and physical disorders and eventually insanity may develop. The only cure is to cut off the supply of the drug and he should be placed under the care of a skilled attendant.

Cannabis indica, which is also called hashish, Indian hemp, and bhang, is a drug which is used extensively in the East, and the habit of taking it is not very great in this country. Under the influence of this drug all sense of time seems to disappear and the most exciting dreams and visions occur. Taken to excess, this drug produces a mental state which usually leads to insanity.

Other drugs which sometimes give rise to unpleasant consequences are chloral, sulphonal, veronal, and trional. The habitual use of these drugs is usually acquired in the treatment of sleeplessness. (*See also* ALCOHOLISM.)

Drug Rashes.—Occasionally, after a patient has been taking a drug, he is horrified to find that shortly afterwards he "comes out in a rash." He finds that this occurs each time he takes that particular drug, and quite rightly blames it as being the cause of the eruption. He is, however, only partly correct in assuming this: if the drug alone were to blame, *every* person taking it would be similarly affected; as it is, only one or two in a hundred suffer. There is, therefore, the peculiarity of constitution, or idiosyncrasy, as it is called, of these patients to be taken into consideration as well as the nature of the drug itself.

The number of drugs that have been blamed at various times as being the cause of an eruption on the skin is so great that it would be impossible to give a complete list of them. In many cases, moreover, an eruption has been noted with a certain drug in only one or two out of a great number of people—perhaps thousands—similarly treated; these cases must be considered merely as individual curiosities. Other factors have also to be taken into consideration. Sometimes the drug is impure; or given with other drugs which together produce a rash in that particular patient—sometimes the patient's digestion is at fault; or, more often, his kidneys. Several drugs are found to cause a rash more readily in patients whose kidneys are affected.

Drug eruptions are found in very many different forms; there is no class of eruption that has not its counterpart among the drug rashes. They are generally "spotty," and often resemble measles, scarlet fever, small-pox or German measles. Sometimes they are like nettlerash: but literally anything in the nature of a rash may be found, from a simple pink spot to hæmorrhage or even gangrene. A drug rash has, of course, no relation whatever to its ordinary action on

the body, as may be proved by the same drug producing varied rashes in different people, or different drugs producing a similar rash.

Only the rashes associated with the more commonly used drugs are here described in their more common forms. They are, naturally, of considerable practical importance, since not infrequently, in ignorance, a patient may continue to take as a cure for his "skin trouble" the very drug that is its cause!

Antifebrine (acetanilide) produces a rash like measles. If the drug is discontinued, it fades in a few days; if it is used regularly, it finally produces a peculiar purplish-blue colouring in a pale skin, which may be described as a "slate-coloured anæmia."

Antipyrine (phenazone) is calculated to produce a rash in two per cent. of men and seven per cent. of women. There are various forms, the commonest being the "measly" variety, which lasts for three or four days, and is followed by peeling. The face and neck are seldom, if ever, affected. Wheals and blisters are also seen; all these forms are accompanied by itching. Sometimes a single dose will produce a rash; usually it requires several and it disappears in a day or two after the drug is stopped. Sometimes large isolated spots, about the size of a shilling, occur; these are more chronic. They always appear on the same places, and, if it is not recognized that the drug is their cause, may become permanent, and of a deep brown colouration.

Silver nitrate produces a condition known as argyria, which is a permanent bluish-grey discolouration all over the body, including the whites of the eyes. This was formerly a common condition, both among workers in silver and people taking silver internally, but in its complete form it is now seldom seen. Silver staining of the eye is still seen in some cases where silver drops have been used.

Arsenic eruptions can be produced either by local contact, or by taking the drug internally. The former is seen in workers in artificial flowers, cardboard boxes, and aniline dyes, of which arsenic is a frequent impurity; and "beautifying" skin lotions are a not infrequent cause nowadays. The "Manchester beer epidemic" of 1900–1901, when arsenic was found as an impurity in the beer, showed graphically what an enormous variety of eruptions could be produced by one drug taken in small doses over a long time. The most typical chronic eruption affects the palms of the hands and soles of the feet; these either become unnaturally pink (the "pink palm"); or small areas become hardened and horny; these fairly often become cancerous later. In due course, the skin of the legs becomes inflamed. The most remarkable eruption associated with arsenic is shingles, which is very apt to occur in those taking the drug. *Salvarsan* and other drugs of which arsenic is a constituent, produce much the same effect as arsenic itself.

Barbitone, commonly used in "sleeping-powders," may produce a "scarlet fever" or blotchy rash.

Belladonna produces a bright red, "scarlet fever" rash. It is usually only on the face and neck, is very itchy, but soon fades, and there is no "peeling."

Boric Acid sometimes produces a pink spotty rash, but the more usual form is a crop of pimples, each pimple becoming scaly at the top. It may be seen when boric acid has been used as an antiseptic wash, or when taken internally. It may, in rare cases, produce so great a skin disturbance as to be fatal.

The Bromides very often produce a rash —it has been found that three out of four persons taking potassium bromide are affected. It may occur as a pink spotty rash, or as nettle-rash, or as blisters; but the most typical form is the so-called "bromide acne," which consists of little pustules, or pimples containing pus. This at first sight looks like the common skin disease of that name, but there are no black-heads; and unlike acne proper, "bromide acne" occurs all over the body—even on the roof of the mouth. It is well known among epileptics who have been in the habit of taking large doses of potassium bromide for years; here the eruption is very chronic. It is also common in children who have been ignorantly dosed with "teething powders"; or it may occur in infants whose mothers, during the nursing period, are taking the drug.

It is treated by taking arsenic internally, with a lead lotion for the skin condition.

Chloroform is sometimes followed by a pink rash which is, however, temporary.

Ergot, which is, or was, much used in midwifery to prevent hæmorrhage after birth, has been known to produce rashes of varying severity, or even gangrene of the extremities, when taken in very large quantity.

Eucalyptus is so frequently taken for colds and chills that the possibility of its causing a rash may be missed; the usual form is a crops of wheals, resembling those of nettle-rash, on the hands and feet; the wheals may be accompanied by red "blotches."

The Iodides may cause a rash when used either internally or externally. The general remarks on the bromides apply also to the iodides (which indeed are closely related chemically). A really wild mixture of eruptions has been noted: spots, blisters, hæmorrhage into the skin, an "iodide acne" closely resembling the bromide acne, ulcers or "gummata" closely resembling those caused by syphilis, and even large solid tumours that have at first been thought to occur from leprosy or cancer! The difficulty of diagnosis is sometimes very great. Naturally, in a great many cases the doctor knows that iodide is being taken, and is on the watch, but a great many cases follow on the taking of certain patent medicines, many of which contain iodide, usually in small amounts.

These rashes may occur from quite small doses, but usually follow a fairly long administration of the drug. They occur more commonly if the kidneys are affected in any way. In view of the common occurrence of the rash, iodide is generally much diluted when taken internally, either by water, mineral waters, or milk. If a rash occurs, iodide is stopped at once, and tonics and general "stimulant" treatment given, as an iodide rash very much lowers the health.

Mercury is used in several forms, and may produce a rash when used internally or, especially, externally, *calomel* being the chief offender. The "scarlet fever" variety is the most common rash, but many forms have been seen. Sometimes a very severe rash occurs, which is accompanied by fever, a feeling of illness, and acute inflammation and swelling of the lymph glands. This is followed by peeling, which may be repeated several times.

Morphia not infrequently produces an intense itching before a rash is observed. The usual rash resembles scarlet fever very closely, and is followed by profuse peeling. If a sore throat occurs at the same time, the diagnosis is sometimes very difficult. Occasionally the rash may consist of pimples or wheals.

Phenolphthalein, which is frequently used nowadays for the relief of habitual constipation, sometimes produces a rash occurring as pink "plates" on the skin. Like antipyrin, if it is used for some time, the spots may take on a brown colouration, which is permanent.

Quinine, when taken internally, produces a large variety of rashes, the commonest being the scarlet fever type. When the nettle-rash form occurs, it may be very severe, producing so much swelling of the face that the eyes may be closed; and also produces quinine "asthma," which gives rise to much distress in breathing. A quinine rash may be treated with calamine or lead lotion, with liquor carbonis detergens added to either. (*See also* OCCUPATIONAL DISEASE for an account of quinine workers' rash.)

Rhubarb sometimes causes a "scarlet fever" rash, which is followed by peeling.

Santonin, which is used in cases of round-worm infection, often produces a "nettle-rash" eruption.

Salicylic Acid and the Salicylates which are so much used for rheumatism produce a great variety of rashes; itching sometimes occurs, and peeling follows the rash.

Sulphonal and Veronal (Barbitone), like many other sleep-producing drugs, cause a "scarlet fever" rash, which is itchy and followed by peeling. They are peculiar in that they almost always "worsen" any skin disease that may be present, and should therefore never be taken in these circumstances.

Turpentine when used internally produces a very severe "scarlet fever" rash accompanied by pimples.

Diagnosis and Treatment.—It is sometimes very difficult, as might be expected, to distinguish a drug rash from one of the diseases it imitates, especially if the patient does not associate the rash with the drug. Quite often he will be asked by his doctor what medicines he has been taking, and will answer "none," honestly forgetting a few doses of rhubarb "to settle his stomach," or a headache powder or two. Naturally, if he has consulted his doctor previously, and a "suspected" drug has been prescribed, the disturbing factor will be easily enough traced.

In general, it may be said that though drug rashes resemble those caused by disease in many cases, they do not imitate them quite well enough to deceive the careful eye. A drug eruption is often far more widespread and severe than a similar eruption from disease: antipyrin and copaiba, for instance, are far more "measly" than a true measles, and bromide and iodide acne occur over the whole body, instead of chiefly on the face. Sometimes the drug eruption is less than that produced by disease, as in the iodide ulcers resembling those of syphilis. Generally, too, there are no constitutional symptoms such as occur in the imitated disease. Children often provide a difficulty, as their temperature goes up so easily with any little "upset"; but the lack of the other symptoms of the disease imitated must be taken into account.

All these factors considered, it is really only possible, in the majority of cases, to make a mistake if one is careless about the history of drug-taking; or ignorant that a rash may follow the taking of certain drugs.

The treatment in most cases is very simple. It consists in stopping the offending drug entirely; and in hastening elimination—in other words, "speeding the parting guest"—by the copious drinking of water and in the use of mild drugs which increase the output from the kidneys, and of purgatives, which increase the output from the bowels.

DRUNKENNESS.—The spectacle of a drunken person is known to us all, and perhaps a good definition of drunkenness would be to say that the term means all the effects of recent over-indulgence in alcohol which are visible to other people. The amount of alcohol necessary to bring about a state of drunkenness differs with different people. Some persons cannot take more than a very small amount without showing the signs that we associate with drunkenness; while others can drink a vast amount and still not be what we would call "drunk," although a few minutes later they may be raving mad with delirium tremens.

The chief effect of alcohol is to "take off the brakes." In ordinary life we practise a considerable amount of control over our actions in order to make our doings fit into the orderly scheme of communal existence, that is so that we will not be a nuisance to other people, but this control is slackened by alcoholic drinks and relaxed altogether in the state we speak of as drunkenness. The drunken man is not responsible for his actions, but this does not absolve him in the eyes of the law for the crimes he commits while drunk, because he is responsible for being in the state of drunkenness, at all, except perhaps in the state known as dipsomania which is now considered to be largely a form of mental disorder.

Alcohol has a slightly stimulating effect at first, but this is followed by depression, so it is wrong to look upon alcohol as a real stimulant. The gaiety and friendliness with which a drinking bout starts are succeeded by suspiciousness and quarrelsomeness. Next comes silliness and, finally, stupidity and sleepiness, followed by drunken stupor or sleep. The face flushes and the pupils of the eyes grow larger, the breathing becomes slow, loud and irregular. The hands tremble and the speech becomes indistinct; or, if the person is aware of his state and has a powerful will, he will pronounce every word precisely with great care.

Tests for drunkenness are sometimes not very satisfactory, as other conditions, some of which are of serious importance, will produce almost the same symptoms. It is as well, therefore, not to come to a definite conclusion if there can be any possible doubt in the diagnosis. In many cases, for instance, of persons who are charged after an accident, with being drunk while driving a car, the driver has to be given the benefit of the doubt because the shock of the accident may produce in him the same symptoms as if he were drunk.

Treatment.—It is of course necessary to see that no more alcohol is taken, and steps should be taken to get as much of the alcohol as possible out of the system quickly. This is done at a hospital or by a doctor by means of the stomach pump; but if this cannot be done an emetic of salt and water, or mustard and water should be given. When the patient has been sick he may be given strong black coffee or strong tea. Sal volatile or ammonia are also useful. Cold water to the head or whole body are also helpful. (*See also* ALCOHOL; DELIRIUM TREMENS; DIPSOMANIA.)

DRYNESS OF THE MOUTH.—The mouth is kept in a moist state by a constant flow of saliva, which is the fluid which is poured into the mouth from the salivary glands. These glands are to be found under the tongue and

behind the jaw. Like other glands of the body they are under the control of the nervous system. A stimulus is received from without by the part of the brain which controls them, and orders how to proceed are carried by the nerves to the glands which obey. This is the procedure followed by all the functions of the body; but in the case of the salivary glands and the nerves that control them, the working can be more clearly seen, than it can be in the case of, say the glands pouring their gastric juices into the stomach. Thus the mere sight of food will cause the mouth of a hungry person to "water," and the smell and taste of food do likewise. The first part of digestion of food is begun in the mouth by the saliva as it mixes with the food, and the saliva is also necessary to keep the various movable parts of the mouth "oiled" as it were, and thus prevent them from hurting each other by rubbing dry surfaces together.

It happens for various reasons that the flow of saliva is sometimes interrupted. The cause should be searched for and overcome. Dry mouth or "xerostomia" is a rare nervous disease found sometimes in people, usually women. Mouth-breathing or taking of drying-up medicines such as atropine for any length of time will cause a dry mouth. It is often present after operations or fevers, or any condition where the body is quickly losing its moisture. These temporary conditions can be helped by sucking glycerine and borax pastilles. (*See also* DIABETES INSIPIDUS.)

DUCT.—The ducts of the body are the channels or tubes by which fluids are carried from one part of the body to another. As a rule the chemical substances, or secretions as they are called, of the various glands are poured into these ducts. For example, the fluid which goes to make up the saliva is carried to the mouth by the salivary ducts. Other ducts are the bile ducts leading from the gall-bladder and liver, the sweat glands all over the body, the lymphatic glands and so on. (*See also* DUCTLESS GLANDS.)

DUCTLESS GLANDS.—Recent investigations have established the fact that all the bodily functions are under the control of powerful chemicals or drugs. Still more recently it has been shown that even the nerve impulses in certain nerves called the autonomic nerves actually cause the changes that occur at their nerve endings by setting free certain strong chemicals. The body and its workings are therefore under the control of chemicals. Some of these chemicals are obtained from the food and are called *vitamins*, and others which are called *hormones* are manufactured in the body itself. All the tissues contain bodies which are able to set free chemicals which have a powerful effect. This can be seen especially in the way they behave when they are injured. There are, however, certain collections of cells in the body whose special work is to manufacture these chemicals and pour them into the fluids which circulate throughout the body, such as blood and lymph. Their action then becomes a general one involving the whole or part of the entire body. The substances which are manufactured by these glands are not collected together in a common tube or duct, but are taken away directly into the cells by the body fluids. In this way they are unlike the ordinary glands of the body, and so, in contrast to them, are called the *ductless glands* or *endocrine glands.*

At the present time a great deal of interest is being taken in these ductless glands or endocrines, and an enormous amount of work is being done on the subject of them, so that our ideas about them are being constantly changed and enlarged by new discoveries. Moreover, the relations between the various ductless glands are so complicated, that only parts of their fascinating story are yet clearly known. We must content ourselves, therefore, with a short description of the chief discoveries that have been made so far.

The Suprarenal Capsules or Adrenals are two small yellowish bodies which are found attached to the upper part of the kidneys. They consist of two parts, the *cortex* or bark, and the *medulla* or centre. From the medulla a very useful substance is produced which is called *adrenalin.* It can also now be manufactured artificially by the chemists. An injection of this substance has the same effect as would be produced by a stimulation of the part of the nervous system called the sympathetic nervous system. Recently a stronger substance of the same kind has been discovered in the medulla of the adrenals; and also, from the cortex of the adrenals, another substance has been produced, which, although it is still only obtainable in an impure form, is able to keep alive people in

whom the adrenals are diseased or have been removed. This substance has been given the name of *corticin*. Disease of the adrenals, which is called Addison's Disease, is apt to be fatal and is associated with low blood-pressure, great weakness and a peculiar bronzing of the skin. Corticin is the only known thing which will relieve this condition. Another substance which is being obtained from the adrenals is an acid which is called *hexonuric acid* and is believed at present to be the same as Vitamin C.

The Carotid Gland.—This is a collection of cells lying between the fork of the carotid artery where it splits into its two main branches at either side of the neck. It is now known to have a power of affecting the blood-pressure.

The Coccygeal Gland.—A tiny collection of cells lying in front of the tip of the coccyx (tail) at the lower end of the backbone. Its use is still unknown.

The Gonads (testicle).—The glands of the male reproductive system. Recently an extract has been prepared from the testicle which appears to have some power of restoring the sex characteristics which are under the influence of the chemical which is produced by the testicle. This, in its turn, is apparently under the control of the anterior pituitary gland. This gland also seems to be responsible for certain of the male characteristics, amongst which are the mental changes associated with puberty. Attempts are being made to use it to prolong the period of active sex life or delay old age. This work is still in the experimental stage. The extract which was used in earlier experiments was obtained from monkeys, hence it gained the popular name of *monkey gland* treatment.

Two extracts are now obtained from the ovaries of females, one from the ordinary ovarian substance and the other from the substance of the ovary during pregnancy.

The Pancreas.—The pancreas, which in animals is called the sweetbread, contains special tissue which produces the substance called *insulin*. This substance controls the turning of sugar into energy by the tissues, and has also to do with the storing up of sugar in the form of starch which is called *glycogen*. People whose supply of insulin is deficient are subject to the disease called Diabetes Mellitus, or sugar diabetes, so called from the sweetness of the urine due to its containing large quantities of sugar. They are starved of energy because the greater part of the body's energy is obtained from the burning up of sugar and this can only take place in the presence of insulin. The result is that the sugar is poured out from the stores of glycogen, but since it cannot be used; is given off in the urine. The patient accordingly becomes very thin and weak and may die. Insulin cannot yet be made artificially so efficiently as the natural insulin; though synthalin, an artificial imitation of insulin, may be useful if insulin cannot be given in certain cases.

Pineal Gland.—This is a small gland situated in the brain. Tumours of this gland have been found where there is hypertrophy of the tissues of the sexual organs. Its uses are not, however, fully known.

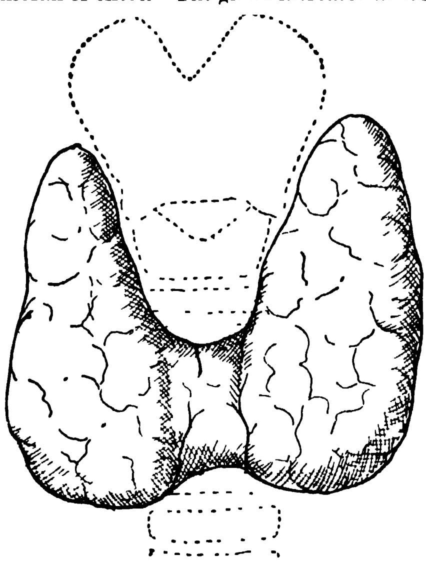
The Pituitary Gland.—This is a small gland lying in a hollow on the floor of the skull above the root of the nose, which, though small, is important enough to have been called "the leader of the endocrine orchestra." It consists of three parts: the anterior, or front, the intermediate, and the posterior or back part. The functions of the intermediate part are not clear. The anterior part is amazingly interesting, because it is known that its products control the growth of bones, especially the long bones. Over-production of its juices leads to the person being a giant. Too much pituitary extract in adults leads to growth of the lower face bones, hands and feet, a condition called "acromegaly." In addition, it is now certain that the extract of the anterior lobe causes the development and ripening of the sexual organs. Failure of this juice leads to the person remaining permanently in a condition of infantilism with regard to the development of the sexual organs. The pituitary extract is also associated in some way with the retaining of the fœtus, or unborn baby in the womb. During pregnancy a substance which resembles the pituitary extract is found in the urine, and at one time it was thought to be identical with it. It is used most successfully as a test of human pregnancy.

From the posterior part of the pituitary gland is obtained a secretion whose activities are well known, but whose place in the machinery of the body is not yet definitely known. Its chief activity consists of raising the blood-pressure by its action both on the

heart and on the blood-vessels, and it is therefore very valuable in treating shock. It has also a very powerful action on the womb and causes it to contract so it is used in midwifery. It also has an important action in regulating the water balance of the body, especially when the water balance is wildly disturbed as it is in Diabetes Insipidus, or water diabetes as it is sometimes called. It has, as well, some influence on the sugar chemistry of the body. These extracts cannot yet be obtained in a completely pure form. They are among the most powerful of known substances.

Spleen.—While the main function of the spleen is to act as a reservoir for blood, there is some evidence to show that it produces a substance which has the power of causing a rapid improvement in the condition of the blood. This work is still in an early stage.

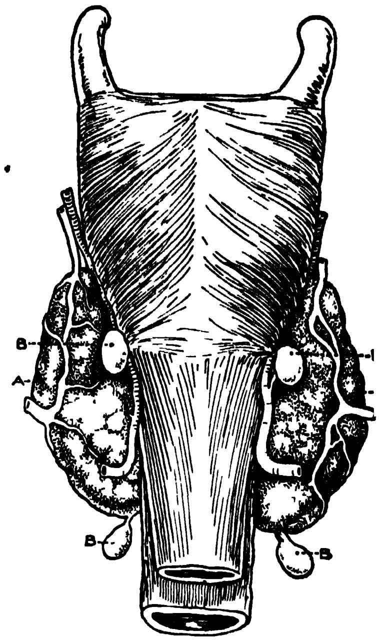
The Thymus Gland.—The thymus is a large gland lying in the upper part of the thorax or chest. The gland increases in size



Thyroid Gland

until birth, when it slowly shrivels up. Its uses are quite unknown.

Thyroid Gland.—The thyroid gland is a large gland situated in the neck just below the Adam's apple, but extending up both sides of it. This gland in early pre-historic man actually poured its material directly into the alimentary canal, so it is not surprising to find that an extract from it will work almost equally well whether taken by

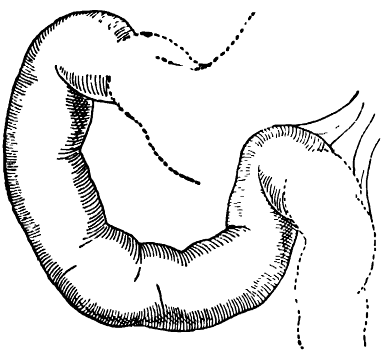


Parathyroid
A Thyroid Glands; B Parathyroid Glands

the mouth or as an injection. This is not true of the secretions of the other glands which only possess a feeble action if any, when taken by mouth. An active extract has been abstracted from the thyroid and can be manufactured artificially. It is called *thyroxin*. The manufacture of it by artificial means is one of the great triumphs of chemistry. It is peculiar in that it contains iodine. Its main effect seems to be in connection with the chemical processes of the body, including those of growth. An absence of thyroid leads to failure to develop mentally and physically as in cretins and idiots. In older people failure of the thyroid has not quite such severe results, but it still leads to great stupidity and to various changes in the skin and hair, a condition which is known as myxœdema. Both conditions can be relieved by taking thyroid extract or thyroxin. Too much thyroid, on the other hand, will cause a speeding-up of the various processes of the body. The symptoms are loss of flesh, nervousness, flushing, and damage to the heart. This

condition is called Graves' disease or exophthalmic goitre, because there is also great protrusion of the eyeballs and enlargement of the thyroid gland.

The Parathyroids.—These are small collections of cells situated either actually in the substance of the thyroid gland, or just outside it. An active extract prepared from these tissues produces a large rise in the amount of the chemical called calcium in the blood. Moreover, injections of the extract are able to restore to the normal persons suffering from the peculiar train of symptoms known as tetany, a condition which, when it is very severe, may be fatal, and which is due to damage to or removal of the parathyroid glands. The details of this extract are not yet known.



Duodenum

Conclusion.—All these ductless glands are closely related to each other in their workings, and disturbance of one leads to disturbance of the others, and to considerable confusion in the working of the body as a whole. As has been said, there is at the present time a great deal of research work being done on the subject of these glands, and all the time new discoveries are being made with results in the treatment of disease which may be described as truly wonderful; yet there is still much that is equally wonderful to be unfolded in the future.

DUMBNESS.—Dumbness means being unable to speak or to utter any of the sounds which make up words. There is a type of dumbness which is due to deafness, in which people are dumb because they have never been able to hear sounds. This type is explained more fully under the heading of DEAF-MUTISM.

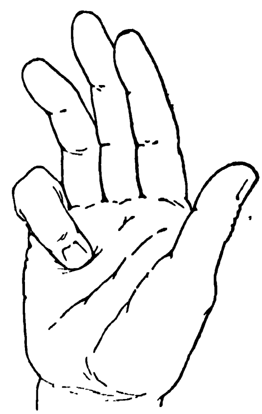
When the hearing is good, dumbness is usually due to a disorder of the organs which produce the voice, or it may be due to some nervous disorder. Mentally-defective people are very often dumb, and certain hysterical conditions produce dumbness. Sometimes children suffer from a slight form of dumbness through such defects as tongue-tie or enlarged tonsils and adenoids. Sounds may be able to come, but words are prevented from being properly formed because of the obstruction in the throat. Stammering and lisping are really slight forms of dumbness, but these can generally be cured by careful training. (*See also* DEAF-MUTISM.)

DUODENAL ULCER.—The duodenum or beginning part of the intestine is, like the stomach, subject to ulceration. In the case of stomach ulcers, the pain comes on after the food has been received into the stomach, that is immediately after food; but in the duodenum the ulcer is caused by the action of the gastric juices on the lining of the stomach, so the pain occurs when the duodenum is empty, about two hours after food, and is immediately relieved as soon as food is taken into the stomach and the gastric juices are occupied in dealing with it. Alkalis such as bicarbonate of soda counteract the gastric juices, which are acid, and render them less active, so large doses of alkalis relieve the pain of duodenal ulcer. Duodenal ulcers used to be much more frequent in men than in women, but now that so many women are out working and leading the same sort of lives as men it has become just as common amongst women as amongst men. Duodenal ulcer may occur amongst both smokers and non-smokers, but when there is an ulcer it is as well to give up smoking, as anything which increases the activity of the gastric juices, as tobacco does, will be bad for the ulcer.

Symptoms.—Duodenal ulcer occurs at any age after childhood, but as it can be present for as long as twenty years without giving rise to more than a slight discomfort at intervals of months, or perhaps only for a few days in the spring and a few days in the autumn, it is not often diagnosed until middle-age, when the symptoms begin to get more troublesome. The pain, as has been said, comes on a couple of hours after food, or may only be thought of as a greater than usual hungriness as the next meal-time approaches.. If a definite spot of pain is

present it will be just to the right of the middle line of the abdomen and above the navel. There may also be an aching pain in the right side of the back, under the shoulder-blade. It is quite usual for people with duodenal ulcers to waken in the night with a pain which is immediately quietened by taking some food or alkaline powder or mixture. The appetite is usually good with this sort of ulcer, and the patient may remain fat and well-looking, in marked contrast to the person with a stomach ulcer who always becomes thin. The bowels are nearly always constipated, and when the ulcer is large and active there may be continuous bleeding from it with the result that the stools will be dark in colour. These dark stools, due to intestinal bleeding, are called *melæna*. The chief danger with duodenal ulcer is that the ulcer may be eating its way through the wall of the bowel and may break through or "perforate," as it is called, when a very serious situation arises with dramatic suddenness. Duodenal ulcers, unlike gastric ulcers, rarely turn into cancer.

Treatment.—As has been said, duodenal ulcers may cause very little trouble for a great many years, and in fact the condition is more likely at this stage to be a *duodenitis*, or irritability of the duodenum, rather than a true ulcer, so that if all that is worrying the person is the slight discomfort before meals, it is a good thing to carry biscuits in the pocket and take doses of an alkaline mixture of magnesia, bicarbonate of soda and bismuth between meals. If, however, there are signs that the trouble is getting worse or is spreading to other parts, such as the gall-bladder, then a serious effort must be made to bring about a cure. This is a lengthy business if it is to be permanent and satisfactory, as the essence of the treatment is to rest the digestion, and this can only be done at the expense of the patient's strength for work. It is usual for the doctor to begin by putting the patient to bed for a month on a diet called the *Sippy diet* after its inventor. This, in its earliest stages, is just as little food as will keep the patient going. The usual thing is a small glass of milk which has been citrated, every two hours, with perhaps Benger's food occasionally. Alkaline drinks are given in between times. This goes on for a fortnight, with the patient in bed. In the third week a little more food is added, such as a little thin bread and butter, raw egg in milk, junket, custard and jelly. Next week potato soup, cornflour, arrowroot, sago and tapioca may be added. In the fifth week a lightly boiled egg, white fish mashed up, thin toast or rusk with butter. For yet another week or fortnight the only addition to the menu must be finely-minced meat. After that there should be no more trouble from the ulcer, and in all but bad cases it should be cured sufficiently not to return if care is taken to avoid highly spiced and very hot food, too large meals, too long time between the meals, smoking, alcohol, and anything that is known to disagree with the individual. The alkalis should in some cases be continued permanently, a small amount of the powder or mixture being taken at intervals or one good dose each day. The surgical treatment of duodenal ulcers is not as satisfactory as that of gastric ulcers, though it may be necessary and result in an improvement in the patient's health and comfort. No operation, except in an emergency, should be undertaken until the medical treatment has had a thorough trial, and as will be seen from the account given above of the highly specialized treatment, a half-hearted attempt at the special diet while the patient tries to carry on his daily work will almost certainly be useless.



Dupuytren's Contraction

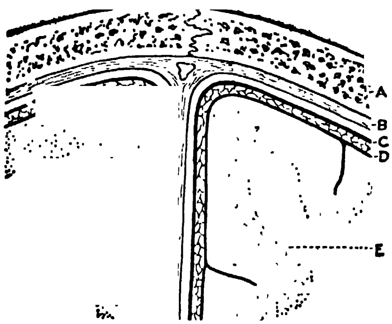
DUODENUM.—The duodenum is the first part of the small intestine or bowel, and is connected with the stomach by a valve called the pylorus. It is eight to ten inches long. The gastric juices from the pancreas and the liver empty into it, and it therefore plays a great part in the digestive system of the body. At its lower end the duodenum joins on to the coils of the small intestine called the jejunum.

DUPUYTREN'S CONTRACTION.—This is the name given to the condition commonly

called contracted fingers, where the muscles of the little and fourth finger contract and the fingers bend over into the palm of the hand. *See also* CONTRACTED FINGERS for a fuller description.

DURA MATER.—This is the name applied to the outer covering of the brain and spinal cord. There are three coverings altogether, but the outer one, which is the strongest one of all, gets its name from the Latin words meaning hard mother. (*See also* BRAIN.)

DUST-BIN, THE.—It is not too much to say that a dirty dust-bin may be the source of serious illness. Unless the lid fits down tightly and is kept in place—not knocked off



Dura Mater:
A Skull; B Dura Mater; C Arachnoid; D Pia Mater; E Brain

by prowling cats at night, for example—flies can get in. The dust-bin is a breeding-place for germs. Now come the flies, swarming on decaying refuse, springing up into the air with all kinds of filth on their legs, and swooping down on our sugar-bowl or jam-pot.

We all know the dust-bin smell. In Paris no refuse is allowed to lie about over-night. The householder puts out the box of rubbish on the edge of the pavement at night, and the dustman collects it early in the morning before most people are awake. In contrast to this, we in this country sometimes allow our refuse to wait for several days before it is carted away. Moreover, several families may have to share a dust-bin, and by the end of the week the smell is decidedly offensive, so this question of the well-fitting lid is all the more important.

Here are some simple dust-bin rules drawn up for a county borough:

(1) Your dust-bin should be kept in first-class repair.
(2) The lid should be tightly fitting.
(3) As much as possible, decaying matter should be burnt, if fires or coke burners are available.
(4) A layer of dust and ashes at the bottom will keep the bottom clean.
(5) Alternation of dust and ashes between the decaying refuse will keep the dust-bin sweet.
(6) Wrap all decaying rotting food tightly in paper.
(7) Watch for jagged edges, in the interests of the dustman's hands. Blood poisoning is easily set up under the conditions in which they work.

DYSENTERY.—Dysentery is an infectious disease of which the chief symptom is acute diarrhœa. There are several types of this disease, some being more severe than others, but in the main, the symptoms are all very much alike. Infection is carried by means of food and water; flies and insects also play a large part in the spreading of this disease. Dysentery occurs in hot climates, and especially in Egypt, India, Irak and parts of America. During the Great War our troops out in the East suffered more from dysentery than any other disease, and no doubt it inconvenienced the men more than the enemy's shells.

Symptoms.—The disease generally begins with a feeling of illness, loss of appetite, and a certain amount of diarrhœa, which gradually increases in severity and is accompanied by griping pains in the abdomen. At first the motions may be thin and watery, but very soon blood and mucus, or slime, is passed, and finally the motions consist of little else. The discharges from the bowels follow each other with great frequency, and the painful feeling of downward pressure which is always present, cause the patient to desire to go to stool all the time. Although the health may not be very greatly disturbed in a mild case of dysentery, it increases with the advance of the disease, and in severe cases the patient may die from sheer exhaustion and from loss of blood.

There is usually fever present, and the patient may suffer from thirst and scanty and painful flow of urine. At this stage the patient is usually very low and depressed and the discharges from the bowels become more offensive and are passed all the time.

If, on the other hand, the course of the disease is checked before it becomes too

severe, the signs of improvement are shown by the number of motions which are passed. These become less in number and more natural in appearance and the pains and straining become less severe. Convalescence is, however, a very slow business and attacks may come on again from time to time.

Preventive Treatment.—In countries where epidemics of dysentery occur, it is of the utmost importance that steps should be taken in order to prevent the disease spreading. The water supply must be properly protected, and care must be taken to see that all the excreta of persons who are suffering from dysentery or who are convalescent from the disease is properly disinfected or burnt. All food should be protected from flies by placing netting over it, and only boiled water should be used for cooking and drinking and for washing food and food utensils. Constipation should be avoided, also the eating of unripe fruits.

Curative Treatment.—The patient should at once be put on a diet consisting of albumin-water, rice-water, or light meat broth, and then arrowroot and cornflour. He should rest in bed and doses of castor-oil may be given along with opium to relieve the griping pains. In severer cases the drug which is most used is emetine, the extract of ipecacuanha. This is given night and morning for several days, the dose being lessened as the motions become more natural in appearance. Treatment depends on the type of dysentery present, and at the earliest opportunity the motions of the patient are examined in order to find out the exact type of germ which is causing the disease. A serum, appropriate to the germ found, is used; other remedies which relieve the symptoms are carbonate of bismuth in large doses. Yatren is the name given to a mixture of various drugs, and this treatment is used if the diarrhœa still persists. The bowel is first washed out with an enema containing bicarbonate of soda, and then a warm, weak solution of yatren is injected into the rectum.

In the treatment of dysentery, the chief points to which attention should be given are the nourishment of the patient, and the proper care of his clothing and body, etc. During convalescence, red meat should not be given; in fact, all rich food should be avoided. A change of climate will sometimes complete the cure when all other means fail.

DYSMENORRHŒA.—This is the term applied to unusual pain at the menstrual periods. The complaint is a very common one and may be due to various causes. The subject is dealt with more fully under the heading MENSTRUATION.

DYSPEPSIA.—By dyspepsia is meant indigestion, which includes any sort of pain or discomfort in the working of the digestive system. Dyspepsia is a symptom of the more serious stomach diseases such as ulceration, but it is also present in a great many people for some simple reason, usually a fault in their diet or mode of life, over-tiredness, etc. Some people are constitutionally dyspeptic, and though the condition may do them no harm it may lead them to worry about their health more than is good for them. The subject of dyspepsia or indigestion is dealt with in the article on INDIGESTION.

DYSPHAGIA.—The word dysphagia comes to us from two Greek words meaning difficulty in swallowing, and it is the term used whenever the act of swallowing cannot be carried out without difficulty. Dysphagia may be painful if it is caused by tonsillitis or any other throat complaint, but painless dysphagia is often experienced by people who are suffering from paralysis. Hysterical people may complain of difficulty in swallowing, but with them the condition does not usually last very long. (*See also* HYSTERIA.)

DYSPNŒA.—Dyspnœa means shortness of breath and is an important symptom in certain diseases. (*See also* BREATHLESSNESS.)

EAR, THE.—The ear is that one of the special sense organs of the body which enables us to hear; it is also concerned with the sense of balance. It is usual to consider the ear under three divisions when describing it: the *external ear*, the *middle ear*, and the *internal ear*. The part of the external ear which stands out from the head and acts as a collector and receiver of air waves is called the *auricle*. It is so shaped that it can bring the sound waves to the passage, or *external meatus*, which leads from the outside

to the middle ear. At the further end of this passage is the ear drum, which is set in motion when sound waves strike on to it. It vibrates, and by its vibrations the waves are conveyed across the tiny space behind the drum called the middle ear to the internal ear. It used to be thought that the sound vibrations were conveyed across the middle ear by the three little bones called *ossicles* of the ear, the *malleus*, *incus* and *stapes*. It is now considered more probable, however, that these ossicles have a damping effect upon violent sound vibrations and thus serve as a protection to the inner ear from too violent noise. The ear drum, also, has a much less important part in hearing than used to be imagined. A person can **hear** quite well with a perforation or hole in the ear drum so long as no suppuration is going on; it does not do any damage to the hearing to have an opening made in the ear drum to let out inflammation.

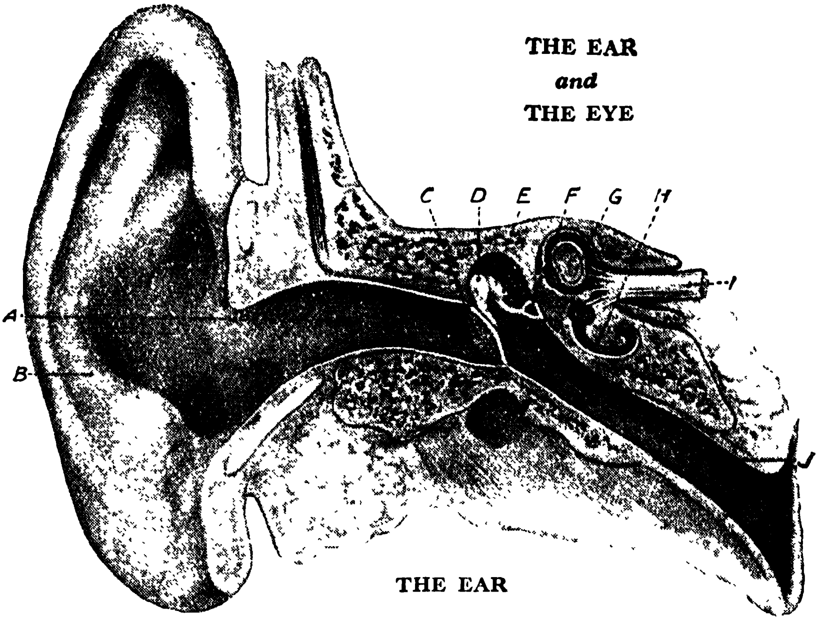
The most important part of the organ of hearing is the internal ear. The third of the ossicles, which is called the *stapes* or stirrup, has its base attached to a membrane which closes the oval window of the middle ear, and movements of the stapes are communicated to a fluid called *perilymph*, which lies within the bony channels of the inner ear. The sound vibrations probably reach the perilymph through the membrane of another little window—the round window—into the inner ear. These movements are in turn communicated to another fluid, the *endolymph* which is found inside the small membraneous canal which lies within the long channels of the inner ear. Movements of this fluid stimulate the delicate nerve endings in the *cochlea* (so-called because it is shaped like a shell). The cochlea is the essential organ without which hearing cannot take place. It sends the vibrations on to the hearing centre in the brain where they are received and interpreted by the understanding. It will be seen from this description that the whole of the ear, or organ of hearing, is a very delicate and complicated piece of mechanism.

The Semi-circular Canals.—The organ of balance consists of three little canals, called the semi-circular canals. They are situated deep in the temporal bone in communication with the internal ear. These canals lie in three different planes of the body, and movements of the endolymph in them stimulates delicate nerve endings, which help the brain to maintain the balance of the body. Diseases which affect the semi-circular canals, such as Ménière's disease, upset the balance.

Diseases of the Ear.—*Wax* (cerumen) in the outer passage of the ear (external meatus) usually causes deafness as well as discomfort; it is removed by syringing with bicarbonate of soda in warm water. A *boil* (furuncle) in the outer passage may be extremely painful, but is not serious; it is sometimes difficult, even for a doctor, to tell the inflammation caused by a boil from the inflammation caused by mastoid disease, but for one thing the person who has a boil is not very ill, though in pain, and is usually not deaf. A boil is treated by having a gauze wick, soaked in a solution of epsom salts in glycerine, pushed past it into the ear passage; this must be changed daily. *Acute inflammation of the middle ear* is always an extension up the little tube that communicates with the throat (the eustachian tube), of inflammation in the nose or throat, often helped by that dangerous procedure, sniffing a nasal douche up the nose. The best treatment of acute inflammation of the ear is to have the ear drum slit with a fine scalpel by a doctor; this lets out the inflammation before it bursts through the drum, making a big hole, and it soon clears up after this little operation. *Chronic suppuration of the ear* may go on for weeks, months, or years, and is a common cause of incurable deafness; it usually follows scarlet fever or measles in childhood. The most popular treatment is to drop in peroxide of hydrogen, but it is probably better to mop out the discharge thoroughly with cotton wool and then blow in boracic powder or 1% iodine in boracic powder, the latter being the latest treatment used successfully in America. Ionization is another useful method of treatment and is widely used in school clinics.

An ear should not be allowed to discharge for more than a month without having a serious talk with a doctor on the advisability of having an operation to stop the discharge; sometimes it means only removal of adenoids, sometimes the simple mastoid drainage operation; but either is better than long-continued ear discharge, which may in time even give rise to a brain abscess, and even when it does not, is a constant worry and a cause of persistent ill-health. Inflammation of the ear may go on to inflammation

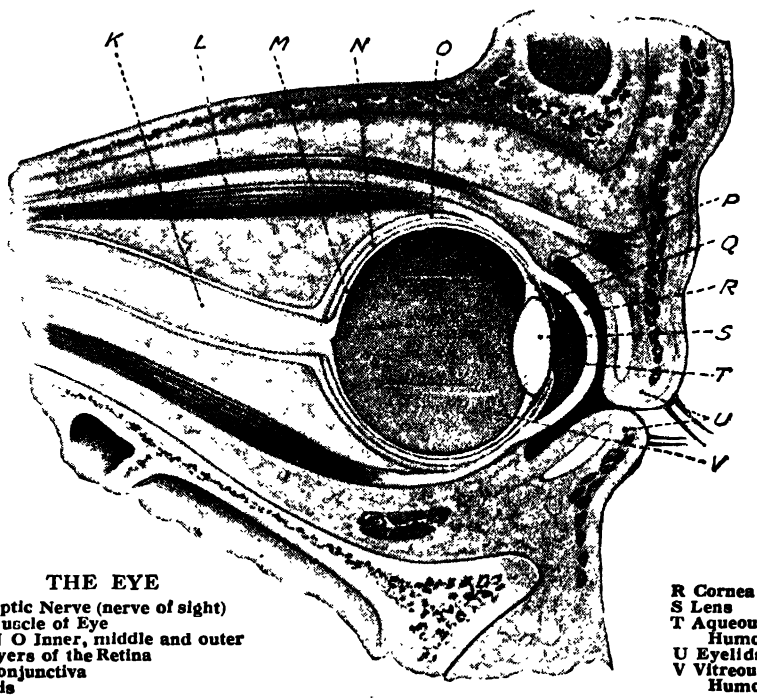
THE EAR
and
THE EYE



THE EAR

A External Meatus (passage of ear)
B Outer Ear or Auricle
C Ear Drum
D Malleus
E Incus

F Stapes
G Cochlea
H Semi-circular Canal (organ of balance)
I Acoustic Nerve (nerve of hearing)
J Eustachian Tube



THE EYE

K Optic Nerve (nerve of sight)
L Muscle of Eye
M N O Inner, middle and outer layers of the Retina
P Conjunctiva
Q Iris

R Cornea
S Lens
T Aqueous Humour
U Eyelids
V Vitreous Humour

of the mastoid. This is a group of air cells in the bone behind the ear, which protects the delicate internal ear; these air cells communicate with the middle ear and any inflammation can easily pass on to them. Unless this inflammation is relieved by an operation, meningitis or brain abscess and death may be the result. Many people are afraid of the word "mastoid" and dread this operation; that is quite a mistaken idea and dates from the days when this operation was only undertaken as a last resort and at the last moment. The modern simple mastoid drainage operation, if performed early, before the inflammation of the mastoid has caused any complications, gives excellent results and is certainly not an operation to dread, while the patient has usually little or no pain afterwards. (*See also* DEAFNESS.)

EARACHE.—Earache is a condition which should be treated with much greater care than it often is. How often does one hear that a child "has only earache"—as if earache were a thing of no importance. Far from being unimportant, earache is one of the aches for which there is almost always a definite reason.

Many things can cause earache. In a small child it may really be the pain from teething that is worrying him, or the child may have pushed some small body such as a bead into the ear. The most serious condition is that in which the pain is round and behind the ear in the part called the mastoid. This part may get infected after influenza or any of the infectious diseases such as measles, but especially after scarlet fever. Unhealthy noses and throats, enlarged tonsils and adenoids all may cause ear trouble of the sort that will later on lead to deafness.

In grown-up people there is sometimes a very slight dislocation of the little pads of gristle or cartilage, which lie between the ends of the jaws. This dislocation may cause excruciating pain in the ears until it is put right.

Treatment.—The cause of the earache must be found and treated by a doctor; but, before that can be done, the pain can be eased by lying down with a hot-water bottle, or hot bag of salt or sand pressed to the ear, or a few drops of warm glycerine dropped in, while some simple pain-deadening tablet such as aspirin may be taken. It may be necessary for the doctor to incise the ear drum and let out matter, a small operation which is soon recovered from and may prevent very serious mischief.

EARTH TEMPERATURE.—The temperature of the earth is taken daily at the Royal Astronomical Observatory at Greenwich, and it is measured to a depth of four feet from the surface. These readings are of great interest in medicine, as the temperature of the earth plays an important part in epidemics of disease. It has been noted that when the temperature is over 56° F. infantile diarrhœa almost invariably breaks out in epidemic form, and outbreaks of lung diseases seldom occur while the earth's temperature is above 47° F. (*See also* DIARRHŒA.)

EASTON'S SYRUP.—This is an old and well-tried tonic for general weakness, but more especially useful in cases where the nerves are fagged by over-work. It is a great help when going through a time of physical and mental strain such as preparation for an examination, stock-taking, the half-yearly audit, etc. The ingredients are quinine, strychnine and iron. When strychnine is contained in any mixture always be careful to shake the bottle well before taking the medicine, as strychnine is heavy and sinks to the bottom of the bottle. Easton's Syrup can also be obtained in tablet form.

EATING.—Eating is one of the things in this life that we must all do and which none of us can avoid. It will be evident, therefore, that like everything else which is worth doing it is worth doing well, and in order to make a good job of our eating, care and thought must be given to the subject. That does not mean that the subject of suitable feeding has to be thought out anew for each person—far from it. Each country and each class of workers or idlers in each country has the experience of previous generations of eaters to go upon, and it is quite likely that what we are accustomed to is what is best for us so long as our meals are well-cooked, and keep us in good health and strength.

When to eat.—Nature provides us with a guide of when to eat, by giving us peculiar feelings in our insides at certain times of the day, so that we say we are hungry and must eat. As a general rule hunger is the best guide if the digestive apparatus has been properly treated and is in good working order. The stomach, like other parts of our beings, must not be our master, but must be early

trained into good habits, and by that is meant habits which are the best for us in our circumstances of life. The way the stomach can be trained is well seen in babyhood, when the baby is trained to take the breast at perfectly regular intervals, and soon ceases to want food between its regular feeding times. An untrained baby, however, will cry for food almost every hour, when it will only take a small amount which will last another hour or so and will again lift up its voice and demand more. Men and women who work about the house are sometimes inclined to treat themselves like these badly brought up babies, and take food in snippets and snacks at varying intervals throughout the day. They always pay for it in the end with digestive troubles. People who go about the business of the day at regular hours find that their stomachs adapt themselves to their hours of work, so that they just begin to feel the need for food as the next break in work and meal time approaches. If there is too much hunger before meals or not enough appetite when eating time again approaches, then the chances are that the digestive organs are not working properly or that the food is not being well chosen for the work it has to do.

It is found that the times of eating the heaviest meal of the day vary for people leading different sorts of lives. A rest after a heavy meal is necessary. For people engaged in heavy physical or manual labour, the heavy meal of the day comes best at the time it is usually taken, between midday and one o'clock, followed by the half hour's lounge and smoke before the afternoon shift. A substantial high tea will be required after the day's work is finished. Teachers, clerks and other people who have to use their brains rather than their bodies during the larger part of the day, find that a heavy midday meal makes them drowsy and unfit for their mental application during the afternoon, so for them the heavy meal comes best in the early evening, and a light lunch of the fruit or salad or sandwich type is all that is required during the day. Children, of course, must not eat heavily for some hours before going to bed, so midday is always their best dinner time. The housewife will have to choose whether she will have her big meal with the children or with her husband, if he has his in the evening. Too many women, however, fall into the bad habit of having dinner with both the children and the grown-ups, and so grossly over-eating, or else merely picking at their food, and never eating a decent meal.

How to eat.—When the appetite is ready and the well-cooked meal is on the table, it is still necessary to perform the rite of eating properly. Peace, quiet and pleasure are still as necessary for good digestion as they were in the days when Solomon said "Better is a dinner of herbs where love is, than a stalled ox and hatred therewith." A teacher, shopkeeper or other person who has had to spend the day surrounded by people may digest his food much better if he reads a newspaper or book during his meal; while for others the cheerful domestic chatter of his family or friends may be the best thing; but the time of eating should be set aside for eating and the mind must be emptied for the time being of worries if the best result is to be obtained from the food set before us. It goes without saying these days that food must not be hastily bolted, but should be properly chewed. Neither should solid food be washed down with great draughts of liquid. Drink before a meal or at the end of the meal as much as is liked, but if a beverage is taken with food it should be in mere sips between mouthfuls. Smoke after meals and not before or during them. A good appetite is a very valuable possession so do not take the edge off it, but bring it in good trim to the table. Your food will then do you lots of good, however simple it may be. The question of what to eat will be discussed in the SUPPLEMENT ON DIET AND INVALID COOKERY.

EAU-DE-COLOGNE.—Eau-de-Cologne, from the French, meaning "water of Cologne," is a very popular toilet preparation or scent containing oil of rosemary and other flower oils. It has always been popular in the sick-room because of the fresh daintiness of its smell, which has none of the heavy sickly odour of other scents. The only rival it has in this respect is our own national lavender water. Both these preparations are cooling when applied to the skin, and so a handkerchief rung out of them and placed on the forehead is soothing to a headache. Eau-de-Cologne may be obtained in a solid form for the purpose of rubbing on hot and inflamed skin to cool it. The town of Cologne—from which eau-de-Cologne takes its name and where the best preparation of it still comes from—is on the Rhine within sight of

France and was used as the headquarters of the British Army of Occupation after the war, so is now well-known to many people in this country. Before the war it was often referred to as a town of "one perfume and fifty distinct smells," but during the last half century it has become a great modern manufacturing town, the Birmingham of Germany. It has a wonderful old cathedral.

ECCHYMOSIS.—This term is used to describe bleeding which takes place just under the skin and is often the result of a bruise. The skin usually has a purplish appearance, gradually changing to green and yellow. (*See also* BLEEDING.)

ECLAMPSIA OR "FITS."—Eclampsia is one of the most serious complications of pregnancy, and is characterized by severe fits. It does not come on in the early months of pregnancy and symptoms of it should be watched for after the fifth month, but it is not unusual for the first fit to occur actually during labour. The exact cause of eclampsia is not known, but it seems to have something to do with disordered chemistry of the body so that a poison is allowed to circulate in the mother's blood instead of being got rid of in the ordinary ways by which the body rids itself of waste products. What this poison is, is not known; but it must be something that develops through pregnancy, as the condition of eclampsia only arises in connection with childbirth.

The earliest sign of eclampsia is the appearance of albumen in the urine, so it is necessary to keep watch on the way the kidneys are working during pregnancy. This is done by examining the urine periodically.

Warning Symptoms.—There are several symptoms which give warning that eclampsia may occur, and if these are recognized in time the condition may be stopped from progressing to the stage of fits. The chief of these warnings is persistent headache, upsets of the eyesight, such as blurred vision, flashes of light before the eyes, and perhaps even blindness; a greater degree than usual of stomach upset, and a lessening in the quantity of urine passed. If these warnings are neglected they may be followed at any moment by an eclamptic fit.

A typical Fit.—In a typical fit the eyes enlarge so that the patient can hardly see, and the muscles of the face begin to twitch. In a short time the body goes stiff and remains fixed. The teeth are tightly clenched and the back is arched. The patient becomes blue from the inability to breathe owing to the spasm of the muscles used for breathing. This spasm of stiffness lasts any number of seconds up to a minute, when the muscles begin to contract and relax alternately and continue to do so for some minutes, after which the patient lapses into a coma, and may remain unconscious a few hours or even a few days. These fits recur again and again at intervals of a few hours, or may follow in quick succession.

Treatment.—Eclampsia fits are always a serious matter, and are especially dangerous if they begin in the last three months before the child is born. If the condition is discovered before the fits begin it may be warded off, but once the fit is on the only thing that can be done is to protect the patient as much as possible from harm and treat the fit. Send at once for the doctor, and while he is coming try to keep the patient from hurting herself in her convulsions. Lay her on the floor, and place something, like a spoon or piece of wood, between her teeth if they can be unclenched enough. Turn her sideways so that the saliva will ooze away. When the unconscious stage arrives she may be put to bed.

The doctor in attendance will administer certain drugs, and aims his treatment at driving the poisons out of the system, but in most cases it is necessary to hurry on the birth of the child in order to save the mother.

ECSTASY.—This is a queer mental state sometimes found in hysterical people, or after an epileptic fit. The person having the fit of ecstasy will stand or sit in a rapt attitude gazing in adoration at some vision seen only by themselves. Often they will become rapturously excited and relate in tones of ecstasy the wondrous thing that they are seeing or hearing. The visions are usually of a religious nature, and when the picturesque side of religion had more hold on people than it has in this prosaic and matter-of-fact age ecstatic visions were commoner than they are now. The classic example of a person who frequently had these visions is Joan of Arc, the French peasant girl of long ago who had visions of herself riding on a white horse and being told by God to put herself at the head of the army and lead them to victory against the English. She was able to

carry out her vision and led the French army to victory. (*See also* HYSTERIA.)

ECTHYMA.—This disease is a severe form of impetigo, in which the germ responsible for the disease makes its way into the skin and flourishes there. Ecthyma is most common upon the legs, between the knee and the ankle, and always indicates that the affected person is seriously run down in health. It usually attacks neglected, ill-fed children, but is also seen in adults whose living is poor, who are uncleanly, and below par generally. Lice and bed-bugs are frequent accompaniments to the disease, and probably help in its spread. The appearance on the legs is that of small ulcers, which have a characteristic "scooped out" appearance when the scab, which usually covers them, is removed. Each ulcer is surrounded by an inflamed reddish ring of skin, and leaves a scar when healing takes place.

Treatment.—This is in itself very simple. Any milder antiseptic ointment serves as a dressing for the ulcer; and under cleanly conditions, where the patient has plenty of vegetables, fruit, and milk, and an iron tonic, he rapidly recovers. (*See also* IMPETIGO.)

ECTOPIC GESTATION.—It sometimes happens that after pregnancy takes place, the fertilized ovum instead of developing normally in the womb, begins to develop in one of the organs outside the womb. This is known as ectopic gestation. The ovum may be arrested in the Fallopian tube and begin to grow in this small cavity; when such a condition arises, it is very serious indeed.

The cause of the arrest of the passage of the fertilized ovum may be some obstruction in the Fallopian tube due to adhesions or possibly due to some former inflammation. As a rule abortion takes place between the sixth and twelfth week of pregnancy and there may be some serious internal hæmorrhage.

Generally there is a history of one menstrual period being missed, but very soon severe attacks of abdominal pains come on and there may be a continuous flow of blood from the vagina.

It is important that the doctor should be consulted at once, as an operation may be necessary in order to save the life of the mother. The condition is a very serious one and always requires surgical treatment.

ECTROPION.—Ectropion is a condition in which the eyelids turn outwards. It is a fairly common condition, and it is due to various causes.

The mildest and simplest variety is that frequently occurring in elderly people whose tissues are lax, so that the lower eye-lid hangs down. It always occurs in both eyes, and the lower lids only are affected. As the condition grows worse, the drainage channel for the tears is drawn from the eye, and therefore cannot pick up the tears as it does when in contact with the eye. As a result, the tears begin to drain away down the cheek, and a vicious circle is set up: the more the tears flow over the cheek, the more the lower lid turns outwards; and the more the lower lid turns outward the more the tears flow over the cheek. Finally, the skin becomes irritated, red and raw, and then contracts, so that the condition of ectropion is rendered worse than ever. This copious watering of the eye is generally the most troublesome symptom in the "bleary red eye of old age," and may result in the complete turning out of the whole of the lower lid.

When the lining of the eyelid is swollen for any reason the lid margins are mechanically pushed out; this form may occur in both lids. Again, the tears tend to flow over the cheek, and the other results usually follow as in ectropion due to lax tissues.

Treatment.—Both these forms are successfully treated by a slight operation; but when the conjunctiva is thickened, treatment aims at reducing its bulk, and astringent or contracting drugs are employed in the form of drops, such as zinc, silver nitrate, tannic acid or adrenalin.

A similar form of ectropion occurs when the facial nerve is paralysed. When this occurs, the muscle which opens and shuts the eye is quite lax, so that the lower lid hangs down. In cases where the paralysis is likely to be cured, the lid may be temporarily supported by strapping, and a pad and bandage; but if the paralysis is likely to be permanent an operation is the only hope of cure.

ECZEMA.—This very familiar word is derived from a Greek word meaning to boil over, burst out, or erupt. Naturally, using the word in its widest sense, *any* skin disease may be called an "eruption" or "eczema," but it really does not mean any one definite type of skin disease; in fact, calling any skin rash "eczema" is much the same as calling any pain of unknown origin "rheumatism."

The more modern skin specialists have now discarded the term "eczema" for the term dermatitis, which means inflammation of the skin. (*See also* DERMATITIS.)

EFFERENT.—This is a term used to describe motion away from a centre, such as the course of a blood-vessel leading away from an organ or a nerve from the motor centre in the brain to the limb it moves.

EFFERVESCENCE.—The brisk bubbling caused by the escape of carbonic acid into a liquid is called effervescence. When effervescent drinks are drunk they have a sharp nippy effect on the back of the throat which is very refreshing. For this reason soda water, which is the simplest form of effervescent drink, appears cooler and more refreshing than ordinary still water. Various flavours such as lemon are added to make pleasant cool summer drinks. When an effervescent drink reaches the stomach it increases the flow of gastric juices.

An effervescent mixture is made up of carbonate of soda or bicarbonate of soda powder, mixed with some acid such as citric acid or tartaric acid. The two powders can be added separately as in seidlitz powders, or they can be in the same mixture as with fruit salts. The well-known sherbert, which is the joy of childhood, is simply citric acid and carbonate of soda in a powder which effervesces when it mixes with the saliva in the mouth.

Effervescent water baths have been found to be very stimulating for the skin, and provide a means of increasing its activity without tiring the patient as much as exercise would. They are therefore used for the treatment of persons with weak hearts and similar complaints. It was treatment of this sort, with the natural sparkling water found in the neighbourhood, that made Nauheim in Germany the great centre for the treatment of heart disease, but the Nauheim treatment is now being followed, with water made to effervesce by artificial means, at the British spas such as Buxton, Bath, Harrogate, etc., and a simple form of Nauheim baths can be made at home in any bathroom.

EFFLEURAGE.—This is the name given to the "stroking" movement used in massage. It is described under the heading MASSAGE.

EFFUSION. — The word effusion (which means a pouring out) is used in medicine in connection with the pouring out of fluid from the normal stream into some other part of the body. One of the most common types of effusion is that which occurs in "housemaid's knee." There is usually a large swelling which is filled with fluid, and the same type of thing occurs in "miner's elbow." The popular phrase "water on the brain" simply means an effusion, and a pleural effusion takes place when fluid collects in the chest, as in pleurisy. Treatment of effusions will naturally depend on which part of the body they appear in and according to their type. (*See also* ASCITES; BURSITIS; DROPSY; PLEURISY.)

EGG.—When we realize that a young chick lives on the contents of an egg until it is hatched out, it is reasonable to suppose that an egg must contain the necessary amount of food for body-building. But the young chicken lying in its shell does not require any energy-making food, and, as Nature is never wasteful in her methods, we find that eggs lack carbohydrates. Carbohydrates are energy-makers and not body-builders; but everything else such as fat, protein, and some very valuable mineral salts are present, thus making eggs one of our most important articles of diet.

Because eggs are easily digested, they form a valuable food for children, especially those suffering from rickets. Raw eggs and lightly boiled eggs are very suitable for invalids, and they are given in quantity to people who are suffering from diabetes, tuberculosis and anæmia. Eggs are part of hundreds of invalid dishes and are included in sauces and puddings, etc. White of egg, whisked to a stiff broth, can be made into a very interesting and valuable part of the diet if lemon juice or vanilla is added to it.

The best way to tell whether an egg is stale or not, is to place it in a pint of water to which has been added two ounces of salt. If the egg floats on top of the water it should not be used; fresh eggs always sink to the bottom.

ELBOW.—The elbow, or elbow joint as it really is, is the hinge joint formed by the bones of the upper and lower arms, that is to say the *humerus*, which is the single bone in the upper arm and the *ulna* and *radius*, the bones of the lower, or forearm. Of these the ulna is on the inner side of the arm and the radius on the outer side. The ends of the three bones are covered with smooth cartilage or

gristle, and the upper ends of the radius and ulna together form a cup-shaped socket into which the rounded end of the humerus fits and is gripped snugly by them. The cartilage and lubricating fluid in the joint enable it to turn easily in the socket. The sharp point which is felt at the tip of the elbow when the arm is bent is the sharpened end of the ulna, and is known as the *olecranon process.*

Injuries and diseases of the Elbow.—The elbow is a part of the body which is in almost constant use, and is therefore very liable to be accidentally hurt. A fall on the hand may dislocate the elbow. A common fracture of the arm is that of the humerus just above the elbow joint. In young children the ends of the bones, called the epiphyses, have not yet become joined in the same solid piece as the rest of the bone and are therefore very easily knocked off the main bone. The olecranon process which is the most exposed part of the elbow is easily broken across, but probably the most crippling accidents to the arm are the numerous forms of muscular injuries to which it is subject. These range in severity from simple strains to the tearing of the muscle from the bone to which it is attached, or breaking of its continuity, both conditions which lead to trouble and may be very difficult to cure. Almost every form of sport in which the arm is used has its own special form of injury, such as *tennis elbow* and *golf elbow.* These are terms loosely applied to several varieties of arm injuries which are apt to occur when playing these games. The little bursæ or bags of fluid which are found near joints to act as pads or shock absorbers, are a very frequent form of trouble in the arm and elbow. The most usual form of tennis elbow being due to chronic irritation of the bursa just above the elbow.

Treatment of elbow injuries.—A stiff elbow is a frequent result of injuries of the arm and, as well as being very inconvenient to its possessor, is actually a danger to him when his work takes him amongst machinery, so above all things treatment should be directed towards restoring or preserving the movement of the arm from the straight position to that of bending the elbow to the shoulder. Massage, remedial exercises and electricity are all of use in these injuries. The elbow is concerned in movements of the arm involving the turning of the hand, lifting, and raising the wrist up and down, and these movements may be damaged by what may appear a trifling injury, and if the damage is allowed to become chronic a long spell of treatment and rest of the arm may be required to restore it to health, so that it is always best to attend to a slight injury when it appears, even if it means giving up tennis or whatever was the cause for the time being. People used to talk of "playing-in" their sore arms or "working-off" their muscle strains. This may make matters worse if real injury is present.

The elbow joint is subject to all the diseases that attack other joints, of which the commonest is arthritis. The arthritis may be simply inflammation of the joint due to infection or injury, or may be tubercular. It is important that it should be treated as soon as it appears, lest serious crippling results from letting the disease get a firm hold. (*See also* ARTHRITIS.)

ELECTRICITY IN MEDICINE.—It is frequently said to-day that we are living in an electric age. We light our houses, clean them, cook our food and get ourselves transported from place to place by electricity. It is not surprising, therefore, that in recent years the use of electricity in medical treatment has made great strides. The changes that different sorts of electric currents can bring about in the human tissues are now better understood, and it is recognized that a wide field of human ailments can be prevented, cured and relieved by suitable and timely electric treatment.

The effects of electricity upon the body are varied, but they may be divided into physiological, chemical, physical, or mental. Sometimes they are a combination of all of these.

A simple example of a purely physiological change is the destruction of the cells of a cancer by exposure to X-rays. Medical ionization, by which is meant the introduction of drugs into the body by means of the electric current, illustrates its chemical effect, and the heating of the tissues by diathermy is purely physical.

Varieties of Electricity.—Electricity is either static or dynamic. *Static electricity,* as its name implies, is stationary. It is given for nervous disorders where there is no organic disease, such as hysteria, insomnia, or nervous headache. In the form called the Morton Wave, it produces massage of the muscles, and can be used in diseases of

the prostate to empty the crypts of the gland. Static electricity, however, is not much used in England, though it is practised fairly extensively in America. The apparatus is bulky, expensive and is very easily injured by damp. Dynamic electricity may be described as electricity in motion, the supposed movement being along suitable conductors.

The sources of such electricity are the electric mains, generators, or batteries of cells. The mains current may be direct or alternating—that is to say the direction of the flow may be constant, or it may be reverse. Generally speaking the direct current is more suitable for medical purposes.

The current (amperage) may be small and working at a high pressure (voltage), or it may be large and working at a low pressure.

How the currents are applied to the body.—In order to treat a patient by means of electric currents passing through the body it is obvious that the patient must be brought into contact with the wires carrying the current in some safe manner, as of course electricity is dangerous used in an ignorant manner. To provide this safe contact, appliances called "electrodes" are used, which are placed on the part of the patient's body which is to be treated. They must be made of some conducting material—that is, a material which allows electricity to pass along it, and a conducting material which can be easily bent to the shape required is the most suitable. Sheets of lead or wire gauze are the usual materials.

Pain, and even burning, will result from concentrating a current over a small area of skin. Electrodes should, therefore, be as large as possible. For stimulating individual muscles and nerves, special small round electrodes are used.

Electrodes are covered with several layers of lint, soaked in warm saline solution, which is a good conductor of electricity. Except when a very short application is intended, care should be taken that the electrode comes *evenly* into contact with the skin; otherwise the current will concentrate at the points of good contact and burning may result. For this reason any cuts in the skin must be closed with collodion before the treatment.

Another method of connecting the patient to the current is to immerse his limbs or whole body in baths of water containing electrodes. These baths distribute the current evenly and are therefore very convenient for applying current over a large area.

For the treatment of hands and feet any vessel of a suitable size and shape, and made of a non-conducting material, may be used.

The full body bath must be of some non-conducting material, such as glass, porcelain, or wood. If the current is taken from the mains, the bath *must* be completely "earthed" and the waste pipe should be of rubber. The taps must be turned off before the patient enters the water and must not be touched during the bath. If more hot water is needed, it must be supplied from a jug.

The electrodes, which are large and hang over the head and foot of the bath, should be protected by a wooden, or similar, grating and the whole installation should stand on a large, thick, rubber mat. There should be no metal objects of any sort within the patient's reach when in the bath.

Dr. Schnee's four-cell bath can be used for both local and general treatments. It consists of a chair, two leg-baths, two arm-baths mounted on adjustable supports, and a switchboard. The whole is mounted upon a thick cork or wooden plinth or stand.

By means of the switchboard the path of the current can be directed as desired. For example, if all four cells are in use, the current can be made to enter the body by the left arm and leg and leave by the right. Or it can be made to enter the body by the arms (or legs) and leave by the legs (or arms). Or, using three cells only, the current may enter by one arm and leave by both legs, or *vice versa*. One, two, three, or four cells may be used. In the latter case it replaces the bath, as the current is made to pass through the whole body in finding its way from positive to negative electrodes.

The advantages of the Schnee over the immersion bath are that the patient does not have to undress and thereby saves time and trouble, as well as avoiding the risk of a chill. There is no danger from earth currents.

Precautions against shocks.—In this and all other forms of treatment, where electric mains are the source of the supply, it is desirable to use some "earth-free" generator. This cannot be over-emphasized. In such an apparatus the "mains" current drives a motor. This is *mechanically* coupled to a small dynamo to which the patient is connected, and there is thus no *electrical*

connection between patient and the mains The treatment chair or couch is generally placed upon a rubber mat and the patient is instructed never to touch an electrode.

Types of current.—*Galvanism* is the name given to current direct or flowing in one direction when used medically.

The *Faradic* current is an alternating current of small amperage but high pressure It is derived from a faradic coil.

The *Sinusoidal* current is derived from a special motor-generator, or coil. It is an alternating current of very low periodicity—not more than 20 periods per second. The alternations are rhythmical and gradual, not abrupt, as in the ordinary current from the mains.

The *High Frequency* current is a complicated one, in which the alternations are so rapid as to be more appropriately termed oscillations. The rapidity of alternation does not stimulate sensory or motor nerve endings and consequently neither pain nor muscular contractions are produced.

Diathermy is another form of high frequency oscillating current, of which the pressure is comparatively low (about 2000 volts) and the amperage high (2–3 amperes).

Application and uses of Galvanism.—*Central Galvanism* or Galvanism applied to the brain or spinal cord, is given in such cases as: Mentally or physically under-developed children; persons subject to seizures of an epileptic form or true epilepsy in its early stages; all forms of nervous exhaustion brought about by overwork, worry, or ill-health, nervous headaches and shell-shock.



Courtesy of Princess Beatrice Hospital

A Modern Hospital Electrical Department

Local Galvanism.—*Joint Disorders* such as: Synovitis.—Inflammation of the membrane lining the joint. The passage of a heavy galvanic current is beneficial in cases of *acute* synovitis. Arthritis.—Galvanism of the part in gouty or rheumatic arthritis rapidly relieves pain and sometimes overcomes the inflammation. Neuritis.—In cases where the condition is comparatively recent, mild galvanism is very beneficial, particularly in sciatica and neuritis of the arm, and sometimes in shingles. The positive electrode is placed centrally so that the current flows outwards along the nerve. Long sittings are needed. Stimulation of Muscles.—Interrupted

galvanism is very valuable in maintaining the nutrition of muscles, whose motor nerve has been damaged. Obviously such treatment can only be given by one possessing a sound knowledge of anatomy. Constipation.—Obstinate cases often yield to systematic daily treatment. Large pads are placed over the abdomen and back. Heavy currents are used *and broken* 20 *to* 30 *times at ten-second intervals*, reversing the current occasionally.

Faradism.—Faradism is used in the treatment of various diseases, but it can also be useful to the doctor in the diagnosis of disease. Its value for both these uses is entirely in its power of making voluntary muscles contract through its effect on the motor nerves. When a faradic stimulus is applied to any point along the path of a nerve, all the muscles whose branches of supply are below that point will contract. Each muscle, also, has its own "motor point," where the nerve enters. If a current is applied at these points, it will stimulate the muscle and make it contract, although it may be too weak a current to do so if it is applied elsewhere. Continuous spasmodic contraction of a muscle is injurious, so that for this reason the current is always interrupted at intervals during the treatment. The current may be controlled by hand or by an automatic interrupter.

Applications of Faradism.—*Injured nerves or muscles* are treated by faradism, and it is in this connection that the electric current is so useful an aid to diagnosis. The muscle itself, will respond to galvanism, but not to faradism. Therefore if the response to a faradic current is normal it proves that the motor nerve of the muscle is unbroken and undamaged. If, however, the response is abnormal then it is known that the nerve is injured. This is known as the "reaction of degeneration." The reaction of degeneration will show by the form it takes what the extent of the injury to the nerve is. If the nerve has been rendered entirely useless there will be no response at all to faradism and only a feeble response to galvanism. Lesser injuries will produce a feeble response to both currents.

Uses of Faradism in Treatment.—It has been said before that faradism or electricity in motion is much more often used in this country than is the static form, galvanism, although the latter is used a lot in America. It will be obvious, therefore, that it has been found helpful in the cure of many different conditions. The chief of these is, perhaps, where there is a degree of paralysis. Here the faradic current is invaluable for maintaining the nutrition of muscles which have to remain inactive because the nerve which controls them is ill. If nothing were done for them and they had to remain inactive for a considerable time they would grow feeble and flabby. Take the case of paralysis of the forearm and hand due to an accident in which the motor nerve of the upper arm has been injured. Daily doses of faradic electricity are given at the motor points of the muscles of the forearm and hand and these muscles are prevented from degenerating while the real damage in the upper arm is being repaired by rest and other treatment.

In cases of paralysis of the muscles of the vocal cords which are not due to any definite disease, but to some such condition as overuse and nervous fatigue, "aphonia" or loss of the power of speech may have resulted. A strong, unexpected faradic shock will usually bring about a cure.

In cases too, of *muscular atrophy*, faradism can sometimes be very useful. Supposing a limb has been fractured and for this and other reasons the muscles have become atrophied through disuse, stimulation by faradic current will be of the greatest benefit. Faradism is also frequently useful in the treatment of the tiresome condition, incontinence of urine during the night or as it is most often called, quite simply, *bedwetting*. Here electricity will be useful if there is no organic cause of the condition such as stone in the bladder, inflammation of the urinary tract, a too-acid state of the body, worms in the intestine, bad nervous disease, or defect in the bladder itself. General treatment must be carried out as well as the local electric treatment. That is to say, the patient must take only a light meal in the evening with as little fluid as possible. The bladder must be emptied before retiring for the night, and the patient must be wakened at regular intervals during the night and be made to get up and pass water. As the condition improves these intervals are made farther apart. Local electric treatment consists of intermittent faradism for ten minutes daily, followed by the other sort of electricity, galvanism for a

shorter interval. Gradually improvement will take place, but the treatment must be persevered with for weeks if necessary. Once the habit has been overcome, it is the rarest thing for there ever to be a relapse.

An interesting use of faradic electricity is to educate muscles which have undergone the operation of transplantation to another part of the body to take the place of more important muscles which have been rendered useless.

High Frequency.—The current of high frequency is a very useful form in which electricity can be administered for medical treatment, as it obtains its results almost entirely by giving rise to heat in the tissues under the skin. It requires special methods of applying it to the patient. These may, like the other forms of electricity, be applied generally all over the body, or locally to one particular part. For general application the patient, instead of being put in a special chair like the Schnee chair, with arm- and leg-rests, etc., or being put in a bath of water, is laid on a hair mattress which has a metal sheet running under it the full length of the couch. This forms one electrode, and as two electrodes are necessary to make a contact the patient is given the other to hold. Thus, when the current is turned on, the patient forms one layer of a condenser, and the metal plate which is insulated by the mattress forms the other. Each oscillation of the current charges and discharges the patient, who only feels a sensation of slight warmth; but if the operator brings his finger to within a short distance of the patient's body, a stream of fine violet-coloured sparks passes to the patient, accompanied by a pricking sensation. Another way of administering high frequency electricity is by seating the patient inside a large upright coil or between two large, flat spirals of wire. Here there is no direct connection made to the patient, but he becomes charged with a high frequency current.

For local application various methods are used. The electrode may be moved over the skin of the patient. There will be no sparking and no sensation except a feeling of mild warmth as long as the electrode is kept moving. Again the electrode may be applied through the clothing, in which case a stream of fine sparks passes through from the electrode to the skin. This produces a burning sensation and the electrode must be kept in fairly rapid motion to avoid reddening the skin. If the electrode is held about six inches away from the skin, a soothing and numbing sensation like a cool or lukewarm current of air is caused. This is called an "electric breeze."

The electrodes for high frequency treatment are mostly made of glass tubes which vary in size and shape according to what they are to be used for. The one used by hairdressers for high frequency treatment of the hair is in the form of a large glass comb with a handle. When the glass tube which forms the electrode is brought into contact, or nearly into contact, with the skin it fills with a violet light.

Effects of High Frequency.—Simple galvanic and faradic currents give rise to a slight degree of heat in the skin over the tissues through which they pass, but owing to the danger of pain and shock the amount of these currents used must be so limited that the tissues below the skin cannot be heated by them. Owing to the rapidity of its oscillations, however, a much heavier high frequency current can be used with comfort, and the heat generated by such a current during its passage is very considerable and is evenly distributed throughout the tissues through which it passes. High frequency, therefore, seems to be valuable in the treatment of disease largely, though not solely, through its power to produce heat.

Effects of High Frequency Treatment.—Whatever may be their cause, however, the effects of the treatment are important and vary widely. The most noticeable effect is a speeding up in the working of the organs of the body as shown by an increased giving off of carbonic acid from the lungs, of harmful acids in the urine, and in cases of gout or rheumatism, by a reduction of the amount of uric acid in the body, or perhaps its entire disappearance. The amount of the very valuable blood substance called hæmoglobin is also increased.

This increased efficiency in the working of the organs of the body is found with all methods of high frequency treatment, though naturally, it is most marked after general treatment.

It is because of its general stimulating effect that it is useful in both cases of high blood-pressure and cases of low blood-

pressure. In high-pressure cases the pressure becomes gradually and permanently lower, whereas in low blood-pressure cases where the high frequency electricity is applied with a good deal of sparking up and down the spine the low blood-pressure will rise.

When the electrode is kept in contact with the skin only prolonged and heavy currents are felt and the sensation is one of warmth. The sweat and mucous glands are stimulated and the blood-vessels of the area under treatment dilate.

What High Frequency is used for.—A very important use of high frequency is to relieve pain in conditions where there is inflammation, whether it be long-continued and chronic pain, or a sharp short attack of the acute variety. The relief obtained is usually immediate, although it may not last long unless a course of treatment is taken. The usual treatment is twenty to thirty minutes three times a week, or local applications may be given from five to ten minutes at a time daily.

The conditions which are treated successfully by high frequency electricity are many and varied. The most usual ones are general applications for such conditions as high blood-pressure, neurasthenia, debility, gout, diabetes. Local applications are given for disease of the breathing system, such as laryngitis, acute bronchitis and asthma. Diseases of the alimentary system such as pyorrhœa, lack of tone in the stomach or intestines, internal piles. Skin disease like acne, alopecia, eczema, impetigo, seborrhœa, chronic ulcers. Other conditions where the treatment is useful are arthritis, neuritis, neuralgia, fibrositis, phlebitis and varicose veins.

Sinusoidal Currents.—Electricity in a special form known as sinusoidal currents is used in a few cases where other electricity would be dangerous, such as certain heart conditions and infantile paralysis. Excellent results are sometimes obtained if the treatment is persevered with.

The important subjects of IONIZATION and DIATHERMY are discussed under their own headings, and Dr. Bergonié's chair for the treatment of obesity is also described under BERGONIÉ TREATMENT FOR OBESITY.

ELECTROLYSIS.—Electricity applied to the skin can be made to have a destructive effect on the little glands at the roots of hairs, and is consequently used by beauty specialists and others to remove superfluous hairs. It is, of course, accompanied by a certain amount of pain, and in unskilled hands may be dangerous and lead to disfigurement. Where there is a heavy crop of "down" on the face electrolysis of the larger hairs may stimulate the growth of the down and so should be avoided, but for an isolated group of strongly growing hairs it is usually a successful though expensive way of having them removed. Each hair has to be operated on separately. (*See also* SUPERFLUOUS HAIR.)

ELEPHANTIASIS.—Elephantiasis is a very suitable name for this most uncomfortable and cruelly deforming disease. It may attack any portion of the body but it seems to favour the legs, causing them to become huge and ungainly like those of an elephant. This disease is caused by a tiny worm which gets into the blood and then passes on into the lymph vessels. These become blocked and the result is a gradual swelling up of whatever part of the body is affected. The disease is most frequently seen in tropical countries and it never seems to develop in cold climates.

Symptoms.—The skin at first is smooth, but afterwards it becomes rough, coarse and thick, and is thrown up in folds just like the skin on the leg of an elephant. Attacks of fever occur at intervals, and although there is no pain there is a good deal of inflammation and swelling. The legs, arms, scrotum and breasts are the parts which seem to be affected more than other parts of the body. A scrotum (the bag containing the testicles) may be of great size, reaching almost to the ground.

Treatment.—Surgical treatment is usually carried out and very often this means cutting off a limb or limbs. An elastic stocking should be worn and the leg should be raised up and rested as much as possible. This may help to delay the course of the disease, especially if injections of tartar emetic are given.

ELIXIR.—Elixir is the name now given to any sweetened and aromatic spiritous preparation which contains a small quantity of an active drug. Cascara sagrada, rhubarb and senna are elixirs in common use. The old phrase "the elixir of life" originally stood for the philosopher's stone which was supposed to be able to turn all metals into gold, prolong life indefinitely, and restore youth.

EMACIATION.—Emaciation means a condition in which there is extreme loss of weight and wasting of the body. This may occur from excessive loss of fluid, in which case the wasting may take place very rapidly; slow emaciation is usually due to the body not getting proper nourishment either through actual starvation from want of food, or because the body is using its nourishment in the wrong way.

In rapid wasting due to loss of fluid, which is a condition most commonly seen in cases of severe diarrhœa or vomiting, the skin becomes shrivelled and dry and the eyes become sunken with dark rings around them. The face usually has an anxious and pinched expression and the body is blue and cold. Continual loss of fluid gradually drains away the energy of the body and the patient may sink into a state of dullness, or even a more serious mental state, and finally reach a state of collapse. Diseases which cause rapid wasting of the body are cholera, dysentery, and summer or infantile diarrhœa.

The signs of slow emaciation are shown by a gradual loss of fat and a wasting away of the muscles. The skin of the body, instead of hanging in folds as it does in the rapid form of emaciation, is drawn tightly over the bones of the body. The face becomes very sunken in appearance and all the bones of the body seem to stick out, especially the bones of the ribs. Emaciation from lack of food may be due to the inability to take food owing to some painful condition of the throat, such as cancer or tuberculosis or to some condition of the stomach caused by an ulcer or growth. Diseases of the pancreas or liver are often responsible for wasting of the body, because they prevent the digestive organs working properly, thus starving the body of its necessary nourishment.

In some feverish states, caused by germs getting into the body, the poisons which these germs produce prevent the cells of the body from getting their usual nourishment. Extreme wasting away from such a cause is seen in tuberculosis. Cancer is another disease which produces a similar effect.

Failure of certain of the internal secretions of the body also cause emaciation. Diabetes is a complicated disease in which there is much wasting of the body brought about by failure of some of the internal secretions as well as a disorder of the pancreas. Over-activity of the thyroid gland is also another cause of wasting or emaciation.

Yet another cause is the excessive use of harmful drugs. Any person who becomes a victim of morphia or cocaine usually develops a haggard expression, and the body, as a rule, becomes thin and emaciated. They almost look as if the drug-habit was over-powering them and gnawing away all their strength and energy. This state is sometimes seen in the last stages of chronic alcoholism.

In some cases mental worries, over-work, over-excitement or sleeplessness may bring about wasting of the body, and there are also certain nervous diseases where part of the brain or spinal cord becomes destroyed, which are responsible for emaciation. On the whole there are many conditions, mental, physical and mechanical, which may give rise to emaciation, or wasting of the body.

EMBOLISM.—Probably everyone has heard of some case in which a woman who has made a good recovery from the birth of her baby and has come to the stage where she is looking forward to getting up, but she sits up in bed, or puts her foot to the ground and, to everybody's horror, drops down dead. This is because she has had an embolism which, on her sudden change of position, blocked some important blood-vessel, so that the heart had to stop beating.

An embolism is a plug of any sort which is floating in the blood-stream. Most often it is made of clotted blood which has broken off from a *thrombus*, or clotting of the blood in a vein, but sometimes it may be composed of other matters which are in the blood-stream, and which have probably broken off from some diseased part of the heart or of a blood-vessel. Air which has found its way into a vein may act in the same way as an embolus, or in countries where various sorts of worms find their way into the body, and especially into the blood, they may form a block in the circulation. Sometimes a very tiny particle of tissue from a diseased part may be infected with germs which increase in number to such an extent that they are able to dam the blood-stream. Whatever the cause of the clot or embolism the behaviour is the same. It floats in the blood-stream until it reaches some vital spot, when it causes sudden death, or it may remain in the blood-stream quite harmlessly, or again it may partially block some vein or attach itself to the wall of the

blood-vessel, when it will probably cause an abscess.

The two cases in which fatal embolisms are most likely to occur are after childbirth and where there is a varicose condition of the veins, as in bad legs. After childbirth the blood in the veins of the womb is very liable to clot and form thrombosis, and there is no way that it can be foreseen that a small portion of clot will detach and cause serious trouble in one particular case while the great numbers of other mothers go unharmed.

In the case of thrombosis of the veins of the legs or elsewhere due to varicose veins, the treatment is always complete rest and keeping the leg still. In bad cases the leg is even enclosed in adhesive plaster to keep it absolutely motionless. This is partly because of the danger of embolism. Sometimes an embolism occurs where a limb has been kept still after a fracture, or a tiny embolism in the veins of the brain may cause sudden blindness or sudden paralysis of one side of the body.

As has been said above, the cases in which embolism is most likely to occur are in women after childbirth, varicose veins, and severe heart disease, in which cases rest in bed is always prescribed anyway, so that the necessary precautions are already taken, and in these, as in other cases, the fatal ending to the condition cannot be foreseen. *Fat embolism* may occur through fat getting out of the marrow of a long bone owing to a fracture, getting into the blood circulation and being carried to a vital part of the body, such as the brain, and causing a block there.

EMBROCATION.—This is the name given to substances which are suitable for rubbing into the skin. They usually contain oil of some sort and some have alcohol as well. They are now more commonly known as liniments.

EMBRYO.—By embryo we mean the fœtus in the womb up to about six weeks or two months after fertilization has taken place of the female element (ovum) by the male element (spermatozoa). After fertilization takes place the ovum grows rapidly in the womb, until at the end of the first month it is about a quarter of an inch long. At the end of the second month it is over an inch long and the beginnings of the human shape can be seen although it still has a trace of a tail. The eyes, ears and nose are forming and the limbs have begun to sprout. The head is particularly large for the size of the body and the brain is beginning to develop. Shortly after this the sex characteristics become recognizable and the embryo is henceforth called the fœtus.

EMETIC.—An emetic is given in order to cause vomiting and this is one of the ways in which the stomach can be rapidly emptied. Nowadays emetics are chiefly used for cases of poisoning and the best ones are those which are in everyday use in the home, as quickness of action may mean the saving of a life. A tablespoonful of mustard stirred into half a glass of hot water will produce immediate and thorough results. Two tablespoonsful of common salt in warm water will act in the same way. If it is available, one of the best emetics is ipecacuanha wine. It is particularly safe for children, and it should be given in repeated teaspoonful doses until vomiting begins. Zinc sulphate (25 grains) mixed with a little ipecacuanha wine and dissolved in hot water is a very excellent emetic.

The ever-present and very popular method of producing vomiting by thrusting the fingers down the back of the throat must not be left out. In urgent cases this should be tried while an emetic is being prepared. Either the fingers of the sufferer or the fingers of another person should be gently pushed far down the throat, but no force or roughness should be used. This method does not always act, but it is worth while trying as it is so quick and requires no preparation.

Emetics have been in use for many centuries, and at one time they were one of the chief forms of treatment for almost any disease. In the days of the Romans, emetics were taken almost daily, and when we read of the enormous banquets they indulged in there is no doubt that they were necessary. Nowadays the habit of sticking the fingers down the back of the throat in order to bring back an over-indulgence in food is occasionally practised by people (not only the female sex) who wish to preserve or attain a slim figure.

Whenever an emetic has been given it is advisable to give a stimulant afterwards, such as coffee or brandy. This is especially necessary if there are signs of collapse. Apomorphine is an emetic which is given by injection and which produces excellent results; vomiting usually takes place within

five minutes of injection but its action generally causes nausea and prostration.

EMETINE.—This is a drug which is derived from ipecacuanha and is greatly used in the treatment of dysentery. It should not be taken except under medical care, as prolonged use of the drug leads to poisoning.

EMMENAGOGUE.—An emmenagogue is a drug which is used to regulate the menstrual periods. Ergot, potassium permanganate, aloes, etc., are used, and extracts of certain ductless glands have been found to act as emmenagogues.

EMMETROPIA.—A technical term used in connection with refraction of the eye. (*See also* EYE REFRACTION.)

EMOLLIENT. — Any substance which soothes, softens, or protects the skin is called an emollient. Ordinary cold cream, lanoline, vaseline or olive-oil are a few of the more simple forms of an emollient. When there is any inflammation of the skin a more powerful emollient will have to be used. (*See also* COLD CREAM.)

EMOTION.—By emotion we mean a feeling which moves us strongly. The chief emotions are undoubtedly fear and anger, though in cases where love and jealousy are strong enough to be classed as an emotion, they, too, can be very strong motive forces. In the medical sense emotions are important because they are accompanied by physiological changes in the body. Think of the behaviour of the body after a sudden fright. For a moment it may seem that our heart has stopped beating, then it begins to gallop, and we breathe quickly, we may tremble, our stomachs may heave, our hairs may rise up on end and we may have an attack of diarrhœa. At the same time we do things without realizing that we are doing so. For instance, we stop dead in our tracks, we step back a pace, we may even cower down. None of these conditions are due to our express will, but are done instinctively by the part of our mind called the unconscious mind over which, as yet, we have not learnt to gain control. The most interesting point about the emotions, however, from the medical point of view is that there actually are chemical changes taking place in the body when a strong emotion is felt, as, for instance, in the case of fear when the tissues of a terror-stricken person become flooded with the powerful chemical known as adrenalin. These changes are caused by changes in the working of the ductless or endocrine glands, which are controlled by the part of the nervous system called the sympathetic nervous system. These ductless glands and the nervous system are explained under their own headings.

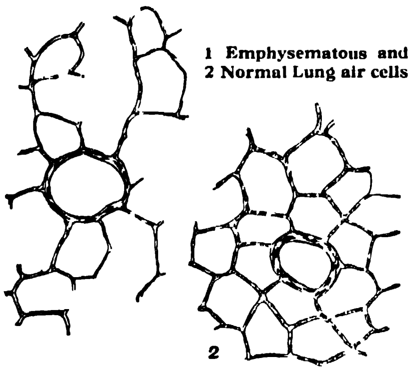
In order to be a good citizen it is necessary to exercise such control over the emotions that we do not cause any unnecessary worry or discomfort to the people with whom we come into contact. The fiery-tempered man who frequently gives vent to his fury is a bad citizen, because he robs his family and fellow-workers of the peace and the ability to go about their business in an undisturbed fashion which is their right. In fact, from a health point of view a man's peace of mind is his valuable possession just as much as his watch and chain, and the person who robs him of it because of his uncontrolled emotions of anger, jealousy, hatred or even love is not very different from the man who steals his watch.

In the olden days control of the emotions was taught at home, in the schools, at Church and Sunday-school and by the personal example of good-living people; but in spite of all this teaching there remained many people who were incapable of learning the lessons. It is extraordinarily interesting to see how, in these days, it is being shown by the scientists that the reasons why some people are incapable of being good citizens are largely due to bodily reasons, and especially to the inefficient working of these little glands throughout the body called the ductless glands. It is marvellous that a course of treatment by an extract of the juice of a little gland in the body should be able to turn a lying, thieving, sexually degraded, mischievous and thoroughly disagreeable girl or boy into a useful and pleasant citizen; but so it is, and we shall marvel the more as the years go by, and more and more is learnt about these matters. The time may come when, instead of committing to prison, the judge may recommend a stay in hospital. (*See also* DUCTLESS GLANDS.)

EMPHYSEMA.—Emphysema is the name given to a condition of the lungs in which the breath seems to be shut in and there is much straining to breathe outwards. Such straining tends to stretch the air-cells of the lungs and in some cases may even tear them, and

the chest becomes expanded and barrel-shaped.

The commonest causes of emphysema are asthma and bronchitis and it also occurs as the result of blowing wind instruments. It is



Emphysema

a condition which is found in elderly people who have suffered from chest complaints all their lives, and each attack of bronchitis aggravates the condition and makes it a little worse. Such people should live in warm climates, or avoid attacks of bronchitis by taking great care of the chest. On no account should these people go out in cold or wet weather; and fog, especially, is dangerous because it irritates the air tubes.

People who are subject to asthma should be very careful with their diet as certain foods tend to bring on an asthmatic attack which at once aggravates the emphysematous state. If the chest becomes irritated, a steam-kettle should be kept boiling in the room and Friars' balsam, added to the water, will be found very soothing.

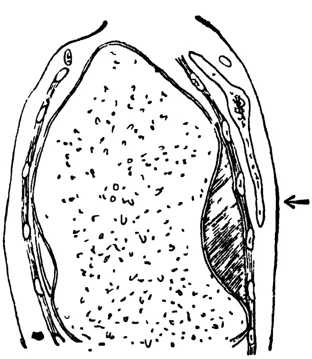
People who suffer from emphysema should be very careful not to over-exercise or tire themselves in any way. Walking along dusty roads should be avoided as dust will tend to irritate the bronchial tubes. There is no cure for this condition, but by taking great care to avoid bronchitis and any strain on the lungs, the progress of the disease may be hindered. (*See also* ASTHMA; BRONCHITIS; LUNG.)

EMPTINESS.—The feeling of emptiness when we are hungry is a very natural one, but this feeling may occur as a symptom of indigestion, and many women experience it when they are pregnant.

When the feeling is due to indigestion it may be relieved by taking food in small quantities or some alkaline powder such as bicarbonate of soda; but there are some forms of indigestion in which the relief is immediately followed by a distressing feeling of fullness, even if only a small meal has been taken. Treatment of the condition lies in the proper treatment of the indigestion. (*See also* DUODENUM; INDIGESTION.)

EMPYEMA.—This is a condition in which pus or matter forms in the pleural cavity, which is the space between the chest wall and the lung. It is chiefly a disease of young children, although it may occur at any age. The condition may really be regarded as an abscess, and, as it is almost impossible for the pus to escape through the thick wall of the chest, it is important that the condition should be cleared up as early as possible, usually by surgical means. The condition may follow an attack of pneumonia, or it may be due to tuberculosis of the lungs or cancer of the throat. Injuries to the chest, such as a gunshot or a knife wound, or any disease in the neighbouring organs, may spread infection and cause empyema.

Symptoms.—If, after an attack of pneumonia, the temperature of the patient does not return to normal, it is usual for the doctor to suspect that empyema is present. There may be no special symptoms at first, but a rise of temperature is a sure indication that infection has spread. Symptoms generally associated with empyema are pain in



Empyema: Longitudinal section through Lung

the affected side, shortness of breath, sweating, and a temperature which varies night and morning. A cough may be present and very often the patient is irritable.

Treatment.—The treatment of empyema is the same as the treatment of any abscess, namely, by opening and allowing the pus to drain away. To do this, it is necessary for the doctor to find out the exact spot in the chest where the pus is lying, and this is done by inserting a needle through the chest wall into the pleural cavity. A syringe is attached to the needle, and if pus is drawn off an operation is usually indicated. As soon as the pus is removed by operation or repeated aspiration with a syringer, the lung usually resumes its normal working order. In some cases the lung may fail to expand; while in other cases, even in spite of operation, the infection may spread with fatal results. Empyema is a serious condition, and much depends on early and efficient treatment.

EMULSION.—Emulsions are thick liquid preparations rather like milk in colour and usually consisting of oils, fats or resins. Milk and yolk of egg are examples of natural emulsions. As a rule, substances such as cod-liver oil are emulsified by the addition of glycerine, which not only hides the taste but makes it easier to digest.

ENAMEL OF TEETH.—Enamel is the outer covering of the teeth and it is the hardest tissue in the body. It is white in colour, but when it is thin, the yellow dentine underneath may show through. Enamel is very readily eaten away by acids, hence the necessity of cleaning the teeth after taking vinegar and certain medicines, etc. (*See also* TEETH.)

ENCEPHALITIS means inflammation of the brain and this may occur in a very large number of ways. Many of the general fevers, such as scarlet fever, measles, mumps and influenza may be complicated by encephalitis, but fortunately, only rarely does this happen. Much prominence has recently been given to that form of encephalitis which very rarely occurs after vaccination. Much more common is an encephalitis which results from extension of infection from the ear or the air cavities of the nose, through the bone into the brain. In these cases, the inflammation is confined to a relatively small area of the brain, pus is produced and an abscess is formed. The danger in this form of encephalitis is that the inflammation will not remain confined to one part of the brain, but will spread to the coverings of the brain—the meninges—and so cause meningitis, which is almost certain to prove fatal. Whilst the inflammation remains localized it is possible to operate and remove the pus, and this is the only hope of curing the condition. But prevention of these abscesses by proper and thorough treatment of all diseases of the nose and ear should be possible if the patients, with such troubles, are seen early enough.

Symptoms.—The symptoms common to all the above forms of encephalitis are the general symptoms of any severe disturbance of the brain substance: severe headache. irritability, sleepiness, vomiting, convulsions. Later the drowsiness becomes more marked and the patient sinks into a coma from which he cannot be roused. Fever, sometimes accompanied by shivering attacks, is almost always present. Where the encephalitis is a complication of such infectious fevers as measles or scarlet fever, the signs of those diseases will be present and the inflammation of the brain being a general one, without any pus being formed, no operation will be of any benefit to the patient. Where the inflammation has extended into the brain through the skull from the nose or ear, the signs which the doctor can find from an examination of the patient will in all probability tell him in which part of the brain the abscess has formed; generally an abscess forms near the place in the skull where the infection has penetrated. Thus, abscesses which are the result of disease of the nose are usually found in the foremost part of the brain; whilst those which have followed disease of the ear are in one or other side of the brain or at the back of the brain, in the "little brain," or cerebellum. This information is essential if the surgeon is to find the abscess and remove the pus. It is sometimes difficult to obtain this information however carefully the patient is examined, because if he is so drowsy that he cannot understand what the doctor is trying to do, the patient may be unable to carry out the instructions given him which are an essential part of the examination. In that case, it may be necessary to operate on very slight evidence of where the abscess may possibly be found.

ENCEPHALITIS LETHARGICA is a curious and, although only recently discovered, a very common disease, known popularly, from one of its symptoms, as "sleepy sickness." Before 1917, no cases of this disease

were known. Since then, there have been several epidemics of it in England and the disease has become scattered world-wide. There is at present no evidence to show that the disease is infectious in the sense that it can be conveyed from one human being to another, but we do know that whatever is the cause of the condition—and it is probably a microbe so small that it cannot be seen under the highest powers of the microscope—it gains entrance to the human body by the nose and throat. The symptoms have varied from time to time in the several epidemics, but for some years there have been no epidemics and the disease seems to have changed its character. In the epidemics, the symptoms were of sudden onset and after an acute illness, the patient, if he recovered at all, seemed for a time to get quite well and then developed certain signs and conditions which for some time did not appear to have any connection with the acute illness. In the cases which occur from time to time nowadays, no definite acute illness can be traced; the symptoms of the conditions which were first thought to be sequels of encephalitis lethargica have turned out to be a chronic form of the disease itself.

In the acute attacks, feverish symptoms accompanied by a history of being unable to sleep for a night or two and a feeling of intense drowsiness during the daytime with "double vision" (i.e. seeing two things instead of one) was the common story. In more severe cases the patient would remain drowsy for days, or even weeks on end. From these attacks recovery occurred in about half the cases recorded. Since the epidemics, it is difficult to obtain a definite description of an acute attack from a patient who presents one of the chronic conditions associated with the disease. The most frequent, and unfortunately the most difficult to treat, of all these chronic stages of encephalitis lethargica is a weakness of movement, with slowness and difficulty in moving the arms and legs, which tends to persist. In typical cases, this condition resembles the "shaking palsy," though the shaking is not always so noticeable as it is in the true "shaking palsy." But there is the same mask-like expression of the face, the same slight bending forwards of the body, the same stiff movements of the limbs; and in some, the same trembling of the limbs. Much can be done with drugs to assist these patients to overcome the stiffness of the limbs, but the trembling does not yield to treatment.

One of the most distressing features of this disease is its effect on the moral character of young people. Children who before they were attacked by it were normal, healthy, delightful creatures, afterwards may become young ruffians and pests to society. The juvenile courts have recently been full of victims of this disease who have come before the courts for thieving, destructive behaviour (e.g. smashing shop windows), attacks on younger children, or sexual offences. In most cases the decision of the doctor that the delinquent had suffered from encephalitis lethargica, has sufficed to have him removed to a special institution for such cases, but there must be many yet which go unrecognized. No child whose behaviour suddenly alters for the worse should be condemned out of hand as merely "naughty," until the possibility of an attack of encephalitis lethargica has been excluded.

On adults, the mental effects are not so disastrous from the legal point of view, but the complete mental outlook may be altered. In cases which recover after severe symptoms, considerable reduction of mental capacity and obvious mental change may persist.

ENCEPHALOID.—This is the term applied to a form of cancer which resembles the tissue of the brain.

ENCHONDROMA. — An enchondroma means a tumour composed of cartilage or gristle. (*See also* TUMOURS.)

ENDARTERITIS.—Endarteritis is a condition in which the inner coat of an artery becomes inflamed or thickened. There are many forms of endarteritis, and it may affect many parts of the body or may be concentrated in one place.

Changes in the inner coat of the arteries are found in tuberculosis: also in diseases of the kidneys and in syphilis. Atheroma is a form of endarteritis in which one of the main arteries, called the aorta, is usually affected. Arterio-sclerosis is a disease in which the chief changes are found in the middle coat of the arteries, but the inner coat may be affected as well.

There is another form of endarteritis, known as intermittent claudication, which

usually affects young people and which produces very distressing symptoms. Burning pain is felt in the legs after walking a short distance and the sufferer is forced to rest. The pain usually passes after a short time, but commences again as soon as a few more steps are taken. The disease is due to the fact that the space inside the artery is affected and this prevents the proper supply of blood reaching the limbs. (*See also* ARTERIES; ARTERIO-SCLEROSIS.)

ENDEMIC.—A disease is said to be endemic to a country or place when it occurs in that particular place more often than in other places, and never completely dies out. For instance, such diseases as cholera and plague are said to be endemic in India and the Far East, because there are always cases of it in those parts. Sleeping sickness is endemic in parts of northern Africa and South America. A disease that is endemic in a country may, under certain circumstances, become epidemic when a very great many more people than usual go down with it. If a disease which is not frequent enough to be called endemic, dies out for a while but always returns in scattered cases, it is sometimes called sporadic.

ENDOCARDITIS. — The word endocarditis means inflammation of the endocardium or membrane lining the heart. The disease is more common in a simple form after attacks of acute rheumatism in some form or other, and in these cases treatment and rest will bring about a good recovery, but the danger is that the condition may not be treated until it has got a hold, and it may turn into a more severe form in which the heart will be damaged. The disease is fully described under HEART, DISEASES OF.

ENDOCRINE GLANDS.—These are certain glands in the body whose function is to form and give off into the blood-stream substances which are very important to our mental and physical well-being. The endocrine glands include the thyroid gland, adrenal bodies, pituitary gland, parathyroid glands, pancreas, ovaries and testicles. The history of the function of these glands forms one of the latest chapters in medicine, and many diseases which are the result of the activity or non-activity of these glands can now be treated, such as diabetes; exophthalmic goitre; cretinism; Addison's disease: The endocrine glands differ from the ordinary glands of the body, in that their juices are not poured into ducts, so their more usual name is ductless glands. An important article on the recent discoveries that have been made with regard to the ductless glands is to be found under the heading DUCTLESS GLANDS.

ENDOMETRITIS.—This term is applied to the inflammation of the endometrium, which is the membrane lining the inside of the womb. There are two types of this condition, the acute and the chronic.

The acute condition is generally caused by the retention in the womb of some part of the *after-birth*, following a confinement or an incomplete miscarriage, or it may be due to gonorrhœa. When due to gonorrhœa, the disease usually spreads upwards from the neck of the womb during the menstruation period, which may stop abruptly and be followed by a discharge. There is usually a great deal of pain in the abdomen, and immediate medical care is necessary.

In treatment of the acute condition due to the retention of portions of the after-birth in the womb, the interior of the womb must be thoroughly cleaned out and disinfected, a slight operation which is known as "curettage," and, as a rule, the condition clears up and the offensive discharges from the womb cease.

Chronic endometritis may follow the acute stage or the condition may be chronic from the first. The inflammation may spread to the muscles in the walls of the womb, and there is considerable discharge from the womb composed of a mixture of pus and mucus. The general health may be very low and the patient may show signs of nervousness.

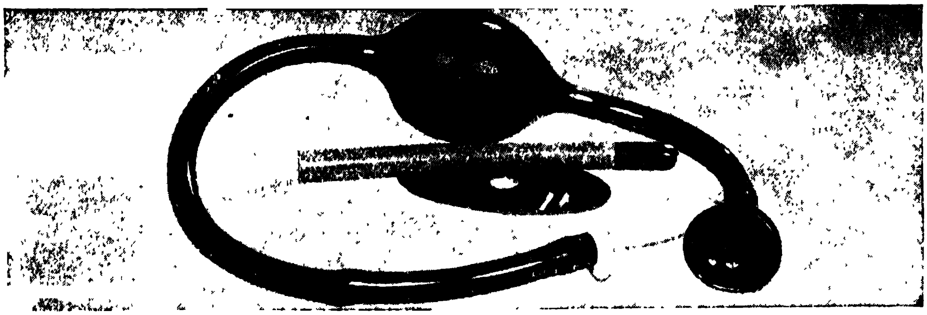
Treatment.—Treatment must be directed towards improving the health of the patient so that she may be able to fight against the state of inflammation present in the womb. The bowels must be attended to and the diet should be light and nourishing; no alcohol should be taken. Tonics of a suitable nature should be given and douches will help to keep the vagina clean. Curettage, followed by thorough disinfection of the womb, is the usual treatment carried out, but the condition is one that may take a long time to clear up. (*See also* PUERPERAL FEVER; WOMB.)

ENEMA.—An enema is used as a method of clearing out the bowel. It takes the form

of an injection of fluid into the rectum which causes the complete emptying of the bowel in a few minutes. It is a very good way of obtaining results, but it is not wise to give an enema in cases of disorder of the bowel without medical advice. An enema is much safer than the indiscriminate use of medicines and pills, and very often a slight obstruction will yield to a simple enema which would cause severe pain if pills were indulged in.

For a simple enema nothing more is required than soap and warm water, but the addition of a tablespoonful of olive oil or castor oil will ensure better results. About an ounce of common soap should be dissolved in a pint of boiling water, add whichever oil is to be used, and stir briskly until soap is thoroughly dissolved. The patient should be placed on the left side with the knees drawn up to the abdomen and the buttocks projecting a little over the edge of the bed. Add cold water until the enema is at a temperature of about 98° F. which is quite warm to the touch but not hot. A Higginson's syringe is a very popular type of enema syringe sold in most chemists' shops, but any type may be used so long as it gives satisfactory results. The bone nozzle at the end to be inserted into the rectum should be well lubricated with vaseline or soap, and the other end should be dropped into the jug holding the fluid. All air must be squeezed out of the syringe before it is inserted into the rectum and this can be done by pressing the bulb of the syringe several times until a few drops of the fluid come through. The bone nozzle must be inserted into the rectum very gently and without any pressure, and the bulb of the syringe must be squeezed slowly and firmly so that the fluid comes through in a steady stream. The patient must make every effort to retain the fluid for a few minutes, and once the nozzle is gently withdrawn a towel pressed tightly against the anus may help to retain the fluid. The amount of fluid used for an adult should be about 16 ounces or two breakfastcupsful, and for children about one ounce (two tablespoonsful) for every year of age. For example, a child of five should be given five ounces, and a child of eight, eight ounces, and so on. Enemas to young children may be given by means of a glass syringe, which is more suitable for small amounts than the ordinary Higginson type.

Constipation is generally the complaint for which an enema is given without medical advice, but there are times when sickness calls for a more specialized type of enema.



Courtesy John Bell and Croyden **Syringe**

A medicinal enema may contain nothing more than a few ounces of soothing substance and may be given to check severe diarrhœa, hæmorrhage, or to save the patient from collapse. For dysentery or summer diarrhœa in children, an enema consisting of starch and opium is a common remedy. If ulceration is present, a few crystals of potassium permanganate, or a small amount of sulphate of zinc, may be added to a cupful of warm water and injected. For shock and collapse due to hæmorrhage or any other cause, the patient should be given an injection of saline solution either directly into the blood-stream or it may be given as an enema per rectum. As an injection into the blood-stream can only be done by a skilled person, the enema can be prepared by mixing a heaped teaspoonful of common salt in a pint of boiling water. About a teacupful of this, when it cools to a temperature of 100° F. which is warmish but not hot, should be injected slowly into the rectum and repeated at intervals of three to four hours.

Children who suffer from threadworms should be given an enema in order to dislodge them from the large bowel. The enema usually given for this purpose consists of a solution of quassia, but a salt solution may be used consisting of a small teaspoonful of common salt in a cupful of water. Vinegar may be given (a teaspoonful in a cupful of water) or a turpentine enema (25 drops in a cupful of water) is sometimes used for threadworms.

In certain illnesses, when it is impossible for the patient to take food by mouth, nourishment may be given by means of an enema. Great care must be taken, however, that no irritation is set up in the bowel, otherwise no benefit will result. The enema must be very slowly administered and the amount of nourishment given at one time must never exceed 3 ounces. It is advisable to give only predigested food such as peptonized milk, peptonized beef-tea, and so on. (*See also* CONSTIPATION; DIARRHŒA; DYSENTERY; SHOCK; THREADWORM.)

ENEMA RASH.—This is a skin rash which sometimes follows the administration of an enema and which requires very careful diagnosis to distinguish it from scarlet fever. The medical name for this condition is erythema scarlatiniforme.

The patient is "upset" and feverish, and these symptoms are followed perhaps immediately, perhaps in a day or two, by a rash which may be almost indistinguishable from that of scarlet fever. Sometimes it is more like a measles rash, but in these cases the diagnosis is much easier, as the other symptoms of measles are absent. Peeling starts early and is very profuse, large flakes of skin being thrown off. In severe cases the hair may fall out, and the nails shed in layers.

The condition is due to some "poison in the blood"; possibly a definite poisoning, as from shell-fish or other food; or from some drugs, especially morphia; or after using ointment of mercury; or sometimes, as its name applies, after an enema has been given.

One attack appears to make the patient more sensitive to other irritating substances and repeated attacks are common. Probably many cases of "repeated scarlet fever," for which patients have even been admitted to hospitals, were in reality due to erythema scarlatiniforme.

Treatment.—The treatment of an attack is simple. Locally, all that is needed is a simple dusting powder. The bowels should be thoroughly well attended to, and "imperial drink," which is made up of lemonade and tartaric acid, is recommended to be taken in large quantities. Quinine, antirheumatic remedies, and tonics are generally given to build up the system and to ward off further attacks; but a thorough investigation to find the cause is the really important part of the treatment.

ENTERALGIA.—This is the term given to pain in the bowels. Griping pain may be felt in the regions of the bowels, especially if some irritation has been set up by food poisoning. The pain may be felt over the navel, but as a rule, the pain is of a griping nature and it may be difficult for the patient to state definitely where it is. (*See also* COLIC.)

ENTERIC.—This was the name used for typhoid fever, but nowadays enteric fever is known to be caused by various germs, so the name typhoid fever is given, and for cases very similar in character but generally of a milder type, the names paratyphoid A and paratyphoid B are used. The term enteric, however, includes all three diseases. (*See also* TYPHOID FEVER.)

ENTERITIS.—This word means inflammation of the intestines and the condition may be caused by various diseases or affections. Diarrhœa is one of the most common causes. Inflammations of the large intestine are given separately under colitis. (*See also* COLITIS.)

ENTEROCELE.—When a hernia protrudes from the bowel it is known as an enterocele. (*See also* HERNIA.)

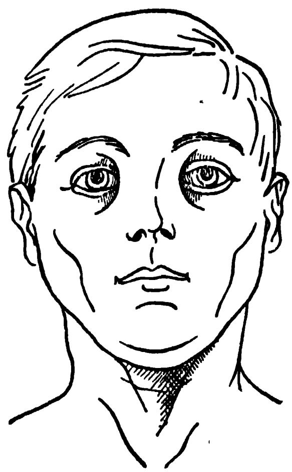
ENTEROPTOSIS.—This word means the falling of the intestines and it exactly describes the condition. Owing to a lax condition of the muscles which support the bowels, these may drop into the lower part of the abdomen and cause much interference with the normal workings of the body. The condition is brought on by faulty habits of standing or by chronic constipation. Women who have had many children are commonly afflicted with enteroptosis owing to the laxness of the muscles, which fail to give adequate support to the abdominal organs.

Treatment.—Massage of the abdominal muscles and wearing of a well-shaped abdominal belt will be found to give most relief. (*See also* ABDOMINAL BELT; CORSETS.)

ENTEROSTOMY.—This is the name given to an operation by which an artificial opening is made into the intestine.

ENTOZOA.—Any parasites which live within, and derive nourishment from the human body are known as entozoa. Worms which live in the intestines form a very important group of the many types of entozoa. (*See also* GERMS; WORMS.)

ENTROPION.—This is a condition in which one or more of the eyelids are turned inwards. It is very troublesome and may set up irritation which often causes serious damage to the eye. It occasionally occurs in infants as the result of an error in development, but it is much more often seen in elderly people. In the latter, the lower lid only is attacked. The laxity of the tissues which occurs in old age allows the lid to turn in, or spasm of the lids may occur which aggravates the condition. If the eye is bandaged for any length of time in elderly people, entropion is very apt to occur; hence many surgeons dislike covering the eye closely after an operation for cataract, but prefer a shade or dark glasses.



Epicanthus

Treatment.—The treatment of entropion varies with its degree. In minor cases, such as occur after bandaging, the bandage and dressings should be removed, and the patient told to stroke the lids gently from the lashes down, or up, as the case may be, so as to pull the lids out. Collodion (often sold as "nu-skin") is sometimes useful; it is painted on the lid every two or three days, after the skin has been cleansed with alcohol or ether. A strip of surgical plaster to draw down the lid is also useful.

In many cases, however, and in all cases which are due to scars, such methods would be useless, and an operation is required to put matters right.

ENUCLEATION.—This is the name given to a surgical operation in which a diseased part of the body such as the tonsils or the eye, is shelled out from its surrounding tissue.

ENURESIS.—This is the medical term for bed-wetting. The causes and treatment are fully described under the heading BED-WETTING.

ENZYME.—Enzyme is the name applied to a chemical ferment which is produced by living cells in the body. Enzymes are present in the saliva and in the gastric juice and in various other secretions of the body. Enzymes play an important part in the process of the proper digestion of our food. (*See also* DIGESTION.)

EPHEDRINE.—This is a drug which is very useful in cases of asthma and other allergic diseases such as hay-fever and urticaria; relief is generally experienced in about twenty minutes after administration. This drug is extracted from the Chinese drug Ma Huang, which was known and used over 5,000 years ago, and is still sold in Peking drug shops in small brownish green sticks.

EPHELIS.—Ephelis is a technical name for sunburn.

EPHEMERAL FEVER.—This is the name applied to a short attack of fever which usually lasts for a day or two. It may occur about the third or fourth day after childbirth, and is often called milk-fever.

EPICANTHUS.—This is the name given to a fold of skin which in some people covers the inner corner of the eye; it generally looks like a half-moon of skin round the inner corner, but may be practically straight. It exists normally in some Eastern nations, but in Europeans is considered, if at all exaggerated, to be a deformity. A small degree of epicanthus is often seen in children, one of whose parents has a high-bridged nose; it is found that as the child grows, the nose grows also, and as the bridge rises, the fold of skin is gradually drawn away from the eyes until they look quite normal.

If this does not happen, and treatment is called for, an operation involving the removal of a small quantity of the superfluous skin is carried out. There are several varieties of this operation.

EPIDEMICS.—"One swallow does not make a summer," and an illness that attacks one person does not make an epidemic. To be an epidemic, it must infect numbers of

people at the same time, or very soon after the first has gone down with it.

Such an illness most of us can remember, when in the last year of the Great War thousands of people "went sick" with influenza. Our military hospitals in France and Flanders were kept busy with it; so were the military camps in England and America. Civilians were ill, too, in England, France, Italy, Spain and Portugal. Seamen on their ships far from land caught it—how, no one knows. It was in Salonika, Egypt, Gibraltar, Malta, India—"explosive," one might well call it, since it broke out in so many places.

This went on during May and June of that year (1918). Germany had it in July, so had Austria, Norway, Sweden, Denmark, Holland and Switzerland. It was not violent; indeed, many soldiers hardly thought it worth while to report sick at all, and were content with a day or so's rest; and as the military hospitals were over-full, this was a solution of what must have been a serious problem for the Army Medical Department. "Like a mild attack of measles without a rash" is how one consulting physician described it.

And then, for a couple of months, it might have been thought that it had done its worst and was clearing off. But back it came in October, and with such violence that this time hardly a country in the world escaped. One sad part of it was that there were many instances of men who were due to come home when this terrible epidemic did what the war had not done, it took their lives just when they had something to look forward to after all the mud and toil and weariness of those four years. And it attacked young people, so that many who were still at school, or just beginning a university or business career, were among the victims.

Nor was this the end of it, for in the following March it broke out again, though this time it was again of a mild nature and it did not last long; still, there were many deaths, and many cases of pneumonia and other diseases of the chest and throat.

Epidemics of typhoid fever are rare nowadays. Typhoid is also called enteric, and while a great many of our soldiers died of it—indeed more than those who died of wounds—during the South African War, in the Great War it was rare, thanks to precautions as to the water drunk by the troops, and to inoculation before going to the Front.

Cholera, too, is traced to drinking-water, and to flies, which are, as we all know, dirty-feeders, and love to pounce down on our nicely prepared table and bring in all kinds of filth from the rubbish heap or dust-bin! So it is easy to understand how in a hot country—India, for example—if the cholera germ is in drains that happen to be near a leaky water-pipe, or if flies feed first on sewage and then come into the house, cholera might spread very easily and quickly. Over-crowding, poverty and bad food, in hot countries, would naturally help the spread of the disease.

"Carriers."—An interesting thing about several diseases is that people can give them to others while they themselves—although they may perhaps have had the illness at some time—are in excellent health; so during the Great War a good deal of attention was, and is still being, paid to typhoid "carriers." When the carrier has been found, an epidemic can often be prevented from spreading any further.

Summer Diarrhœa—Sometimes, in summer weather, the medical officer of health and his staff, nurses, health visitors, and mothers of babies, have to fight an outbreak of summer diarrhœa among the infants. If the summer is unusually hot, there may be many deaths among the poor little sufferers. It is important, at such times, to look to the milk—and the flies, and it is hardly necessary to say: "Send for the doctor at once." When the summer weather is cool and dry, this distressing illness is not so common.

Epidemic diseases to which older children are liable are measles, german measles and scarlet fever.

The house-fly comes in for a good deal of blame, but there is another insect—the rat flea—which carries an illness known as the plague. Very strict inspection of ships when they come into port from any place where there has been a case of plague, and of those carrying any patients with the disease, is the business of our Public Health Authorities, and war on the rat was declared years ago.

The Plague of London.—Nearly three hundred years ago, London was visited by an epidemic called the Plague. It was wonderfully described by Daniel Defoe, the

author of "Robinson Crusoe." He was not born soon enough to have seen anything of it, but he talked with people who had, and truly it must have been a terrible time for the poor people of London. There are many stories of heroism in those dark days when a hundred thousand are said to have died in six months. But the Plague, or the "Black Death," as it was called, was not a new thing in London; it had appeared at least four times before that, and when we picture London as it was hundreds of years ago we are not surprised. Pigs, it is said, walked about in the streets; the gutters must have been unspeakably filthy, and people lived herded together in dirt and poverty—no wonder an epidemic, when it came, spread alarmingly and the better-to-do took their families to the higher ground round the city.

London was not the only place to suffer from these outbreaks of plague, or the pestilence as it is sometimes called. According to one writer, bubonic plague was raging in various parts of Europe all through the sixteenth century at some time or other, and two hundred years before that, the Black Death is said to have killed one-fourth of the whole population of Europe.

In connection with the prevention of smallpox, all over the world the name of Jenner is remembered. Dr. Edward Jenner, a country physician of Gloucestershire, who died more than a hundred years ago, noticed that dairymaids, though they did not catch smallpox, then very common, did take a mild "cowpox." From his observations he discovered vaccination, which became compulsory in England and Wales in 1851, though a good many loopholes still exist by which vaccination can be escaped; and the population of England to-day is, in the opinion of many, not thoroughly enough vaccinated to make another serious outbreak of smallpox impossible.

EPIDERMIS.—Epidermis is the name given to the outer layer of the skin. (*See also* SKIN.)

EPIDIDYMIS.—The epididymis is a structure which is attached to the upper part of each testicle, and it is the beginning of the duct which conveys the secretion of the male organ of conception.

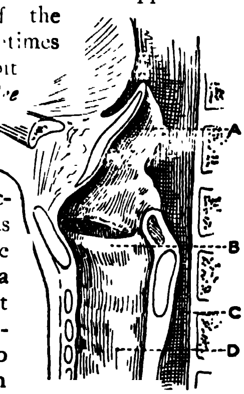
EPIDIDYMITIS.—Epididymitis is the inflammation of the epididymis. It is generally the result of infection and it is a common complication of prostatic disease, but gonorrhœa is by far the most common cause. Tuberculosis is also a common cause of the disease.

Symptoms.—At first there may be pain in the region of the groin and this has often been mistaken for appendicitis. There is usually some fever, and the epididymis rapidly swells and becomes intensely tender and the scrotum usually becomes red and swollen. The pain may be very severe and sickening in character.

Treatment.—The most important line of treatment is rest. The scrotum should be raised and supported on a small pad placed between the thighs and either hot or cold applications should be made. The original cause of the inflammation should be treated.

EPIGASTRIUM.—The large soft part of the body between the chest and the lower limbs which is called the abdomen or, in popular language, the belly, contains many of the most important organs of the body. It is important, therefore, to be able to describe roughly in what part of the abdomen a pain or swelling is situated; so, for the purpose of making description easier, it is usual to divide the surface of the abdomen into different parts or regions. The epigastric region, or epigastrium is the region which lies in the middle of the upper abdomen in front of the stomach. It is sometimes referred to as the pit of the stomach. (*See also* ABDOMEN.)

EPIGLOTTIS.—The epiglottis is a leaf-like structure which stands at the back of the throat. It plays a very important part in the act of swallowing and it helps to prevent food from "going down the wrong way."



Epiglottis:
A Epiglottis B Vocal Chord C Œsophagus D Trachea

EPILATION.—The removal of hairs is called epilation or depilation. The methods of operation are many and varied and are fully described under the heading of DEPILATION and also in the section on BEAUTY CULTURE. (*See also* ELECTROLYSIS; SUPERFLUOUS HAIR.)

EPILEPSY was known to the ancients as the "falling sickness," doubtless on account of the rapidity with which a patient with epilepsy falls to the ground when he has a fit. This disorder has been well recognized for thousands of years, and it is one of the diseases which is viewed with horror and terror by lay people. For fear that their fits will be labelled "epilepsy," many sufferers refrain from seeking medical advice. This is wrong for two reasons: first, because epilepsy may be the symptom of some underlying disease of the brain, which if untreated will threaten life, or at all events be progressive; secondly, because with suitable treatment "real" epilepsy can often be so controlled that no one except the patient is aware that he has in the past suffered from it. It is important to realize that true epilepsy, for which there is no underlying disease in the brain, begins at a very early age as a rule. About one-third of all cases begin before the age of ten, and three-quarters before the age of twenty. If a person above the age of twenty suddenly starts to have epilepsy, it is highly probable that there is some discoverable cause for it.

Epilepsy often begins as infantile convulsions, and persistent infantile convulsions should lead parents to seek expert advice, for the younger the age at which treatment is begun the quicker the fits can be stopped, and the sooner will it be possible to discontinue the treatment. Epilepsy is one of the diseases to which there is a hereditary tendency; sometimes several members of one generation are affected. Although great stress is usually laid by relatives on supposed causes like frights or falls, these are, as a rule, of little or no importance, except in so far as they may have determined the first occurrence of fits in an epileptic subject. Very often such "causes" are blessings in disguise, since they enable treatment to be undertaken at an early age, when the fits are easy to control.

Epilepsy is a disorder which is characterized by attacks of unconsciousness, which may or may not be accompanied by convulsions. When convulsions are present the fit is described as a major fit; when the attack is a very short one, unaccompanied by convulsions, it is spoken of as a minor fit.

Major Fits.—In about half the cases the patient receives some warning that he is about to have a fit. This warning is a very brief one, and the patient does not have time to get to a place of safety before he falls as if shot. The warning may take the form of twitching of some part of the body, such as the thumb or forearm; or curious sensations of "pins and needles"; or a feeling of something queer in the stomach which seems to travel upwards towards the head; or a giddy feeling. As the patient falls he sometimes utters a loud cry, which is so distinctive that it can never be forgotten by anyone who has heard it. By the time he has fallen he is unconscious and has become quite stiff, the head and eyes being turned to one side. The whole body appears rigid and the patient soon appears on the point of choking because he is not breathing. His face becomes blue, the veins in the neck become swollen and the pupils of his eyes are huge. Then the convulsions start and violent jerking movements of all the muscles of the body occur. Air is drawn into the lungs, and is blown out with short puffs, the face soon resuming its natural colour. The jerking movements become slower, though not less violent, and then cease, the last jerks often being the most violent of all. The patient then lies with his limbs limp, his eyes open, though he is still unconscious, and he breathes deeply and noisily. At this stage he will often pass water without any knowledge of the act. After this state has lasted for about ten minutes, he recovers consciousness, recollecting nothing of what has taken place, and if allowed, will then probably fall into a natural sleep, from which he will waken after a few hours. This is a typical epileptic fit; but there are, of course, many slight differences in different cases.

Minor Fits take many forms, and their true nature is often unsuspected until a major fit occurs. There is, however, nearly always a brief loss of consciousness, often so slight that it is called a "faint," a "giddy turn" or a "sensation." The face turns pale in these, there is a fixed expression and anything that is being held in the hand is dropped. The patient may fall to the ground, or the whole thing may be over in a minute or so without a fall. Very occasionally water is passed in one of these minor attacks. The importance of the minor attacks is mainly because their true character goes unrecognized till a major attack occurs, but also

because it is after these minor attacks that mental disturbances may take place which bring the victim within reach of the law. Whilst still in an epileptic state, that state known as "automatism," the patient may commit some crime during a maniacal outburst, of which, when he comes to himself, he has no recollection. Many times has this post-epileptic state been pleaded as a defence in a court of law, but it is a plea which a considerable amount of medical evidence is needed to support.

Epilepsy does not itself often cause death, but injury or death may be caused by the patient falling into the fire or amongst the traffic during a fit. Danger to life from the fit itself occasionally comes from choking, through vomiting before consciousness returns; or if a fit occurs at night, by suffocation if the patient turns over with his face towards his pillow. The first danger can be guarded against by turning the patient on his side if he begins to vomit; and the second, by making him sleep on a horse hair pillow, through which he can easily breathe. During the last stage of the convulsions, the tongue is often protruded and bitten, and measures must be taken to prevent this happening during an attack. The handle of a spoon, a piece of india-rubber, or a cork, should be forced between the teeth. Apart from this, there is nothing to do in the attack but to see that the patient does not hurt himself. The limbs must not be restrained, but all furniture with which the jerking limbs are likely to come into contact must be removed. After the attack the patient should not be roused. He should be left to sleep as long as he can, for patients who are roused immediately an attack is over tend to develop very bad headaches.

In many cases of epilepsy the attacks occur at certain times, either in the morning, or at night. When they occur only at night, they are usually easier to control than when they occur haphazard, or during the day.

Treatment.—Although there are many people suffering from epilepsy who hold high public positions, as a rule there is some mental instability, if not deterioration, in those epileptics in whom the fits are not controlled. It cannot be too strongly emphasized that the drugs which are used to control the fits do not cause mental weakness or mental breakdown; any mental change which takes place is due to the epilepsy and not to the remedies. This has been shown over and over again by the fact that patients who have taken huge doses of the appropriate remedies for years—for fear that the fits would return if they stopped taking the drugs—remain perfectly normal mentally; whilst those patients who refuse to be treated, or who discontinue their treatment against medical advice, rapidly go downhill mentally. It is of the greatest importance to stop the fits; if we can do this we can preserve whatever intelligence the individual possesses. Obviously we cannot turn a mental defective with epilepsy into a genius by stopping his fits; but we can prevent a bright lad from becoming dull, slow-witted and a burden on the community if we are able to control the fits.

The fits hardly ever cease of themselves, except for a short time during pregnancy. The oft-observed fact that they do cease during pregnancy was the cause of much suffering to young epileptic women in the past. They were told that marriage would cure their fits; but after their children were born the fits returned with renewed violence. There is only one successful treatment for true epilepsy; and that is a strict observance of the drug régime laid down by the doctor for each individual case. It is important to anticipate the fits with the suitable drugs, so that if the fits occur mainly at night, the medicine is given in a single dose before going to bed; if they occur only in the daytime, the dose should be given in the early morning. But the drug treatment applicable to an individual case needs to be carefully worked out. During the last few years the discovery of a new drug, luminal, has made the treatment of epilepsy more hopeful than it was in the past, since this drug seems to have a great value in controlling the fits. But the success of the treatment is very largely in the hands of the patient, for he must take the remedy with unfailing regularity for at least two years after the occurrence of the last fit. Then, very gradually, the dosage may be cut down. But many patients who have had epilepsy, and who have had their fits completely controlled, wisely prefer to go on taking a small dose of their particular remedy for years, rather than risk a return of the fits.

Treatment of the general health is also

of great importance. Patients with epilepsy should live in the open air as much as possible, and they should choose outdoor occupations in preference to sedentary ones. Farming or gardening is most suitable. Any occupation which involves situations of danger, such as work with machinery or on scaffolds, for example, must be avoided, and epileptics must not be allowed to bathe for fear of drowning. It is advisable that their diet should contain little meat.

EPIPHYSIS.—It has been said elsewhere that the bones of young children are not made of the firm substance that we know as bone, but are made of gristle and cartilage, which is softer, and bendable. As the child grows older the bone begins to harden, or ossify, as it is called. The hardening process begins in spots, which enlarge until the whole bone is hard. Some bones, however, such as the bones of the leg and arm, are really made up of long shafts with two separate ends, which, when the bone is finally hardened, appear to be all in one piece. The hardening process, however, begins in the shaft and at each end of the bone and leaves bands of the softer material between the ends and shaft for some time after the rest of the bone is hardened. Each end of the bone is called an epiphysis, not an end, until the cartilage between it and the main bone has hardened. The cartilage which remains between the epiphysis and the shaft is called the epiphyseal line or epiphyseal cartilage. (*See* diagram on page 419.)

The importance of these epiphyses is that as long as the epiphyseal cartilage lasts it is a weak spot in the bone and is liable to be injured or be attacked by disease. This is why bone diseases are so very much more common in children than in grown-ups. If the epiphyseal cartilage is weakened through an injury or the debility of the child, germs which would otherwise have remained in the blood-stream may be able to settle in it, and cause suppuration or chronic inflammation, which is liable to spread to the bone itself, and may cause the very severe disease of childhood called osteomyelitis. Tuberculosis and syphilis often cause chronic inflammation of the cartilage. These bone troubles in young children are a serious matter and always require skilled treatment. With regard to the injuries to the epiphysis, the commonest one is for the head of the bone or epiphysis to be knocked off the main bone, and this requires much less force than would be thought necessary. It is what happens when a child is hurt by dragging on its arms, pulling it along the street, or lifting it up from the ground by its wrists. In spite of all that can be said to them, there are still people who will jerk a small child from the floor on to its feet by its wrists. (*See also* BONE; CARTILAGE; JOINT.)

EPISCLERITIS.—Inflammation of the white of the eye. (*See also* SCLEROTIC.)

EPISPASTIC.—This is the name given to a blistering agent of which the most widely used are preparations of cantharides or Spanish fly. (*See also* BLISTER; CANTHARIDES.)

EPISTAXIS.—This is the medical term for nose bleeding. (*See also* HÆMORRHAGE.)

EPITHELIOMA AND "TRADE CANCER."—This is the most usual form of cancer of the skin. It begins as a small hard lump or "plate" of growth; or as a deeper hard nodule under the skin substance. This soon increases in size, and a yellowish-pink waxy-looking growth, with enlarged blood-vessels near by, appears on the surface. This unhealthy tissue soon breaks down and forms an ulcer, the borders of which are raised or rolled above the floor of the ulcer and remain hard and waxy. It very often commences at the junction of skin with mucous membrane (the membrane lining various channels of the body which communicate with the outside), as, for instance, at the lower part of the bowel, or on the lip; if elsewhere, some definite chronic irritation seems always to be associated with its appearance.

It would be incorrect, however, to say that the irritation is the only cause of the cancer. For instance, *a few* workers in paraffin are afflicted with cancerous growths on the hands and forearms, but the great majority escape. *A few* sweeps are irritated by soot, and a "chimney-sweep's cancer" forms, usually on the scrotum; but most sweeps are unaffected. The unknown factor, the "X," which determines that this paraffin worker or that sweep shall have cancer, is entirely unknown, though a tremendous amount of research work has been, and is still being, done on the subject.

To return: chronic irritation is in some cases a factor in causing cancer of the skin Besides the paraffin and soot cancers already

mentioned, cancer of the skin is found to occur among workers in X-rays, coal-tar, silver nitrate, arsenic, and many others, which go under the general name of "trade cancer." It may also occur in a number of chronic skin diseases, especially in people of later middle-age and old people; it may occur in scars, moles, warts, burns, and chronic ulcers; all these varieties of cancer, again, are probably the result of chronic irritation. An interesting form is that seen in Kashmir, where some of the natives carry a "fire-basket" slung from the waist. The skin of the thigh in one particular place is burnt day after day, a chronic ulcer forms, which may in time become cancerous, due to both the irritation of the burn and the constant rubbing of the soot on the affected part. If untreated, a skin cancer rapidly spreads to the tissues beneath the skin, infects the lymph glands, and finally leads to the death of the patient.

Treatment.—If treated *early*, the cure can in most cases be guaranteed. It must be emphasized, however, that *early treatment is the only means by which it can be made certain that the growth will not return.* Too many ageing people disregard, for instance, a small sore on the lip, or treat it with some useless "cure-all" ointment for a few weeks, or a month or two, and are always "going to see the doctor next week." When, finally, the sore has grown to some size, they seek advice, often to be told that nothing can be done, or that only a palliative operation can be performed; which last means, simply, that the surgeon will do what he can to make the sufferers comfortable till they die!

If seen in the early stages, treatment is often entirely successful. It consists in the thorough removal of the growth, and, very often, of the lymph glands in its neighbourhood. Nowadays it is followed by the use of X-rays and radium. An early cancerous growth of the skin, where it is judged that none of the lymph glands are yet affected, may be destroyed by X-rays or radium alone; but even in these cases removal, followed by X-rays or radium, is considered to be the best treatment.

EPSOM SALT.—Magnesium sulphate is commonly known as Epsom salt, because at one time it was obtained from the mineral waters of Epsom. Epsom salt acts on the bowels, and it is perhaps one of the most popular purgatives known. A heaped teaspoonful should be taken in a little water first thing in the morning, or the same dose may be divided into three or four small doses, one of which should be taken every quarter of an hour. In order to prevent griping pains in the stomach, Epsom salt is very often mixed with other substances, such as senna; this mixture is commonly called black draught, but is also known as "white mixture." There is more chance of griping pains occurring if too little water is taken with the Epsom salt, and, ordinarily, about a third of a glassful of warm water will be found sufficient for a teaspoonful of the salt. Some people prefer the effervescent Epsom salt, in which case about two teaspoonsful would be enough to produce the desired effect.

EPULIS.—This term is applied to a tumour growing from the jaws near the socket of a tooth. The usual treatment is removal of the growth by operation.

EQUILIBRIUM.—By the equilibrium of the body we mean its power of balancing itself, so that it may remain upright or in any given position in which we wish it to be. This power of maintaining the balance depends upon the team-work of the muscles, which in turn depends upon the control and foremanship of the brain. A great many causes can upset the balance in a small degree, causing slight attacks of unsteadiness and giddiness, but when giddiness is present and continually and in a severe form, it must be suspected that there is trouble in the nerve centres in the brain or in the little semi-circular canals in the front part of the head which are actually responsible for keeping the body in an upright position. Mental equilibrium is often referred to when a steady, common-sense, sane outlook on life is meant. (*See also* EAR; EPILEPSY; MENIÈRE'S DISEASE; SEMI-CIRCULAR CANALS.)

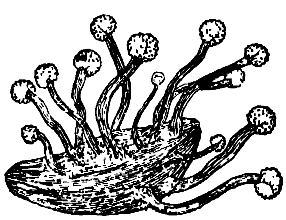
ERECTILE TISSUE.—In certain parts of the body there are tissues which are very richly supplied with tiny blood-vessels, and when these vessels become engorged with blood, they cause the tissues to swell and become hard. This type of tissue is called erectile tissue. It occurs, for example, in the penis, which is largely composed of erectile tissue of this kind.

The interior of the nose is richly supplied with erectile tissue, and this plays an

important part in the protection of our lungs. The fact that the membranes in the nose are able to swell up when they are stimulated by cold air, causes the passages of the nose to close up, and in this way any cold air is slightly heated in the narrow passages of the nose before it reaches the lungs. During a "cold in the head," however, the tiny blood-vessels in the nose may completely block up the air passages and make breathing a difficult performance.

ERGOT.—Ergot is the spawn of a fungus found growing on rye, and it is a very valuable drug in medical practice. It acts on the muscle tissue of the blood-vessels, causing them to contract, and this factor is made use of to check bleeding. But it is after childbirth that ergot is mostly used. By contracting the uterus the possibility of bleeding is much lessened, and the contracting movements are very helpful in causing the expulsion of blood clots from the womb.

Poisoning by Ergot.— Poisoning by this fungus is known as ergotism. It is common in countries where bread is made from rye, or it may occur from an overdose of the drug. There are two types of poisoning: one in which the fingers and toes tingle and itch and finally become gangrenous or dead, and another which seems to affect the mentality. If an overdose of the drug has been given, the patient may show symptoms of sickness, dizziness and diarrhœa. An emetic should be given, followed by some castor oil and a stimulant such as strong tea or coffee, but, above all, the patient should be kept as warm as possible. (*See also* EMETIC.)



Ergot (greatly enlarged)

EROSION.—The word erosion implies a gradual eating away, just as acid erodes and eats away anything it comes in contact with. In medicine, erosion may occur in the tissues and bones of the body from many causes. Continuous pressure may cause the complete disappearance of certain parts of a bone or cartilage, and this may be due to the pressure of a tumour or growth. This sometimes takes place in the spine when the aorta, the main artery leading from the heart, becomes swollen by the formation of a tumour or aneurysm. The gradual pressure may slowly wear away the bone and cause portions of the spine to disappear.

Septic inflammation may cause the tissues to be eaten away or may cause the actual erosion of a part of a bone. In rheumatoid arthritis, the structure of the bones is very often altered, and the cartilage and bones may be eroded through constant rubbing. A very good example of erosion is seen in elderly people when the teeth become worn away by long use and constant friction. The cartilage in the nose may become perforated by inhaling grains of dust or by the habitual use of snuff. (*See also* BONE.)

ERRHINE.—Errhines are drugs which cause running at the nose. Ammonia is an example of an errhine.

ERUCTATION.—Eructation, or belching, means the sudden expulsion of gas from the stomach. Gas is formed in the stomach as the result of the fermentation of food which has not been properly digested. People who suffer from indigestion are very apt to belch after food has been eaten. In some cases, gas may collect in the stomach by the simple means of swallowing air. Many nervous people form the habit of belching slightly, and while they are doing so, they draw in twice as much air as they are letting out, and thus they exaggerate a trivial habit into a serious one. (*See also* ACIDITY; ÆROPHAGY; FLATULENCE; INDIGESTION.)

ERUPTION.—Eruptions of the skin are more commonly known as rashes. These may be caused by fevers, or they may be due to various diseases of the skin such as acne, impetigo, and so on. Eruptions on the skin sometimes follow the administration of certain drugs, or after an enema has been given. (*See also* DRUG RASH; ENEMA RASH; ERYTHEMA.)

ERYSIPELAS.—This disease is also popularly known as "the Rose," or "St. Anthony's Fire." It is an acute infectious disease due to a germ, the streptococcus, and is characterized by a spreading inflammation of a special area of skin, usually on the face, and by the general symptoms of a fever.

It is found all over the world, and at all seasons of the year, but is most common in temperate regions and in the spring. Occasionally epidemics occur. In the Middle Ages erysipelas was confused with poisoning by

ergot. The germ clings to rooms, furniture, bedding, etc., and may be carried by a third person, but is readily killed by ordinary sanitary and disinfectant methods. Uncleanliness favours the development of the disease, as also do chronic alcoholism, chronic Bright's disease,. wounds—whether large or mere scratches—and recent delivery, in which cases mother or child, or both, may be affected.

The disease appears from two days to a week after infection takes place, and lasts from two or three days to two or three weeks, the average being about a week or ten days. Relapses are fairly frequent.

Symptoms.—In a typical case, which most frequently appears on the head and face, the commencement is abrupt. The patient feels cold and shivery; possibly has a shivering fit or rigor, and an attack of vomiting. He often complains of intense headache. The temperature then rises sharply from the normal 98·4° F. to 104° F. or more. Very soon a sharply defined hot, tense, shining patch, which varies in colour from a bright scarlet to a dull brick-red, is seen on the skin. It may occur where there is a wound or scratch, or where the skin joins mucous membrane, as at the nostrils, or the corners of the eyes or mouth. A break in the skin is always present, though it may be so small as not to be noticed. The patch rapidly spreads, though it stops short at the chin, and never extends on to the front of the neck. The centre becomes paler. The edges are raised and hard, the patient complains of "burning" and pain, and the inflamed area is tender to the touch, and "pits" on pressure. The most tender area is the spreading zone just beyond the red margin. Nose-bleeding is common. Soon blisters appear on the inflamed area, which, in bad cases, take the form of blood-blisters.

The face is enormously swollen, so much so that the eyes cannot be opened. The glands in the neck are swollen and tender; the mouth, throat, and nose may also be inflamed. After a few days, in ordinary cases, the inflammation ceases spreading, the redness disappears, the skin peels, and the temperature comes down to the normal. This may happen by a sudden fall (crisis) or by slow degrees (lysis). After the first feeling of illness, the patient is often very little disturbed, but even in mild cases there may be some delirium during the first few nights.

The outlook in most cases is favourable, but there are a few exceptions to this general rule. Chronic alcoholics and elderly persons, whose powers of resistance are poor, are prone gradually to go downhill and die from a slow general poisoning of the tissues, or toxæmia. In infants, the infection attacks the healing stump of the cord at the navel; in this region it is very apt to spread inwards, and is almost always fatal. Erysipelas associated with extensive wounds of the scalp, or after severe injuries, or of the passage leading from the womb after childbirth, or when the patient has kidney disease, is apt to take a serious course. Before antiseptic methods were used, erysipelas was one of the bugbears of surgery, and—especially after operations of any severity—not infrequently brought about the death of the patient.

In some cases the inflammation heals on the face, and spreads to the body and limbs; it is called "wandering erysipelas." Sometimes the red colour is not present; this condition is known as "white erysipelas." At first it may suggest a severe nettle-rash, but may be readily distinguished from this by the general symptoms. In the same way the ordinary form of erysipelas may closely resemble a dermatitis caused by exposure to some irritating substance, such as a poisonous plant, but the general symptoms of erysipelas serve to distinguish the two conditions. After many repeated attacks, a persistent swelling of the affected part may remain; this is most often seen on the face or the leg.

Treatment.—The treatment of erysipelas is simple, and very little beyond good nursing is required. The patient should be isolated; the rest of the family and, still more, visitors must be kept out of the sick-room.

Locally, applications are used to prevent the spread of the disease, to guard against infection by other organisms, and to allay the symptoms. Numerous methods have been advocated to prevent the spread, which it would take too long to describe here. One of the simplest and best is to paint a "barrier," one inch wide, all round the affected area, and one inch away from its margin, with the strong tincture of iodine, or liniment of iodine. The ordinary tincture of iodine is not sufficiently powerful. Care must be taken that the barrier is *complete*; not the smallest area of skin must be

left unprotected. To ensure this it is usual to paint the ring over two or three times, allowing each to dry before the next "coat" is applied. A second ring may be applied one inch beyond the first, to make doubly sure. This procedure is repeated for two or three days, even if the disease does not pass the barrier.

Ichthyol is also considered to be a very good application, either as ointment or lotion. This is spread over the whole of the affected area, and the blisters being pricked by a sterilized needle. Collodion and dusting powder, weak carbolic, or lead and opium fomentations are also advocated. In cases where the scalp is involved, the hair should be cut as close as possible. Ichthyol ointment is considered to be the best application when peeling is going on and itching is often troublesome.

As regards the general treatment, the patient should, at the first appearance of the disease, have a dose of calomel, followed in six hours (or the next morning) by a full dose of salts; this thorough clearing of the bowels in the first instance often cuts short the disease. Laxatives (not strong purgatives) should be used as required, and plenty of water drunk during the whole course of the disease, so that both bowels and kidneys are flushed out, and not only do their own work efficiently, but to some extent put the skin at rest. The diet at first should be as for other fevers, that is, concentrated liquid nourishment; when the fever has abated, the patient should have at first nutritious, though easily digested, food before he is allowed ordinary food; and tonics should be given in convalescence.

If the fever is high, cold sponging or a cold pack are considered to be better than fever-reducing drugs (antipyretics). If the patient is sleepless or delirious, he may have narcotics; morphia and hyoscine are very useful in cases where the delirium is severe.

There is no special remedy for erysipelas. Vaccines prepared from the patient's own germs are often useful, but the anti-erysipelas serum has proved disappointing.

The patient is considered to be infectious until peeling is quite completed. After recovery, he should take a hot bath followed by sponging with an antiseptic; he should then have clean clothing and be moved into another bedroom. His clothing, bedding, etc., should be sterilized, and his former bedroom disinfected in the usual manner. (*See also* DISINFECTION.)

ERYTHEMA, or REDNESS OF THE SKIN.—Erythema, which means redness, is a descriptive term applied to a group of skin conditions in which redness is the chief sign. It is the first sign of dermatitis, or inflammation of the skin, and shows that some irritation is present and acting on the skin, whether from within or without. The term erythema was formerly applied to very widely separated conditions, from bites of insects to the red and swollen skin over an abscess. Nowadays it is becoming much more restricted in its use.

The person is often feverish before the rash comes out, and frequently has a sore throat, or running nose, and red and running eyes, or pains in the joints. In these cases, where there is much disturbance of the general health, it is sometimes very difficult at first to distinguish erythema from scarlet fever, for instance, and until the diagnosis is certain, it is always wiser to treat the case as if it were infectious. No harm will be done if it is not.

Erythema is most common in young people, and is particularly apt to be found in those who have a rheumatic history. It is said to occur most commonly in spring and autumn, and occasionally groups of cases occur, which suggests that some forms may be infectious. The two main characters of erythema are redness and a fluid swelling of the skin, but it has many varieties. It may attack both legs, or both arms, and appear on exactly the same areas in each case. Some forms, indeed, occur so regularly that they have become recognized subdivisions of the main type.

Erythema iris, also called **Herpes iris**, occurs usually on the hands and wrists, and the feet and ankles, but it may also appear inside the mouth. Women are more frequently attacked than men. The eruption appears as round, slightly elevated spots surrounded by a ring of small blisters or vesicles; or there may be a large blister in the centre of the spot. The spots often appear to have a ringed shape, and are said to show a play of colour like a rainbow, hence the name iris, which means a rainbow. One authority, however, says that a better

comparison is to be found in "the archer's target with its golden bull's eye."

The general symptoms of fever, pain, etc., are slight or absent in erythema iris. If the mouth is affected, the spots soon become ulcerated, and may look like an ulcer. It is not uncommon to have a second or third attack; indeed, fairly frequently it has been found that a patient will have several attacks a year for several years.

If it is left untreated, the eruption disappears in two or three weeks, and in slight cases nothing beyond a mild antiseptic ointment or paste is needed. This prevents infection of the broken-down skin. Anti-rheumatic remedies are all helpful in some cases; but the really important thing is to try to find the cause, and so prevent a second attack.

Sometimes a similar eruption is found all over the body, including the face; but this form is evidently not quite the same, as it does not recur nearly so readily, and is usually cured by anti-rheumatic remedies.

Erythema nodosum appears most generally on the front of the legs between the knees and the ankles, and on the "elbow" side of the forearm. It frequently occurs on the legs alone, but practically never on the arms alone. It is almost always found in young people, and chiefly in women. The rash appears in the form of large, rounded, firm swellings, which are very tender to the touch. Afterwards, they become softer and more fluid, but an abscess never forms, nor does ulceration occur; they should, therefore, never be opened. The swellings are at first bright red, then gradually change as the result of actual bleeding from the distended vessels into the skin, so that they resemble bruises, and gradually fade away after undergoing the usual changes in colour of a bruise. The swellings continue to appear in crops for about a month or six weeks, then cease. Second attacks are extremely rare.

The general symptoms, especially the pains in the joints, are often so severe as to resemble rheumatic fever. It appears, though the theory has not yet been proved, to be in some way connected with rheumatism, as in many cases the patients have not only rheumatism itself, but have suffered from diseases associated with rheumatism, such as St. Vitus's Dance, or quinsy; or what is popularly termed a "rheumatic heart."

Treatment.—The treatment of erythema nodosum is simple. It consists of rest in bed until the crops of rash have ceased to appear, together with large doses of anti-rheumatic drugs. It is no use trying to treat the condition locally, but as the swellings may be very painful to the touch they may be protected by a layer of cotton-wool bandaged on not too tightly.

Erythema annulare is a more uncommon form in which the eruption occurs in red rings with a white centre. These rings are so distinctive as to be readily recognized, but its cause is unknown. It gradually fades away and does not return, nor does it appear to leave any ill effects.

Erythema multiforme or **generalized erythema.**— Under this heading are grouped all those forms which have no settled characters. Generally speaking, they affect the body and face more often than the limbs. The rash appears as slightly raised patches of various shapes and sizes, also blisters and bruise-like marks may occur.

Treatment.—The successful treatment of these forms depends on finding their cause. The patient frequently suffers from indigestion, or Bright's disease, or has a chronic infection from the teeth, tonsils or appendix. In some cases an article of food may be the cause, in which case the skin tests which are used for urticaria are very useful. Until the cause is found, the patient should be treated on careful hygienic lines. Plain food, plenty of water to drink between meals, laxatives as required, sufficient but not strenuous exercise, and a general healthy mode of life often cause the disappearance of the rash. Tonics are often helpful in improving the general health.

Locally, a dusting powder may be used on unbroken skin, and clean antiseptic dressing when the surface is raw.

Erythema serpens, sometimes called **Erysipeloid eruption,** is due to infection from the handling of tainted meat or fish. It occurs generally on the hands, especially the fingers, but the infection may be transferred to the face or other parts of the body, or to another person, by contact with the affected hands.

A bluish-red raised ring arises at the point of infection, and the disease spreads very much as does erysipelas. The patient complains of burning and itching of the area, and

in most cases the only way of distinguishing erythema serpens, especially when it occurs on the face, is by the mildness of the general symptoms as compared with those in erysipelas. Sometimes it occurs in ringed form, and may resemble ringworm of the hands. From this it is distinguished by the absence of the ringworm fungus on careful examination.

Local Erythema.—This is just a useful name for various rednesses of the skin which are due to particular local causes, such as the redness due to mustard or other plaster, or to the pressure of garters on the legs, or redness of the buttocks, knees, etc., in bedridden people.

Some people think that blushing is a form of erythema. Other causes of erythema are exposure to heat or cold, as, for instance, the redness followed by a marbled appearance of the legs when they are habitually exposed to the heat of the fire. Sunburn too, and many skin rednesses found amongst people like stokers and firemen who work amongst flames are forms of erythema. Babies whose napkins are not changed often enough, or whose clothes are washed with strong soaps or powders, will get an erythematous rash on their buttocks. A form of erythema which closely resembles scarlet fever is also found. It is described under its more popular name of "enema rash," as, except for cases in which an enema has been given, it is a rare condition.

ERYTHROMELALGIA.—This is a condition in which the hands and feet become red and swollen, and very painful. The cause of the condition is not known, but it is thought that the nervous system may be at fault. The pain may be relieved by raising the limbs or by the application of cold.

ESCHAROTIC.—An escharotic is a substance which is capable of destroying tissue. The commonest escharotics are sulphuric and nitric acids, caustic potash, and red-hot metals. (*See also* CAUSTIC.)

ESERINE.—Eserine is also known as physostigmine, and it is greatly used in the treatment of eye conditions.

ESMARCH BANDAGE.—This is an elastic rubber bandage which is used to control bleeding in amputations of the limbs. (*See also* BANDAGE.)

ESSENTIAL OIL.—Essential oils or volatile oils form a very large and valuable group of drugs used in medicine. These oils may be divided into several classes; for example, the oil of turpentine group, including camphors, are used chiefly for their action on the skin; the group which are used to stimulate the kidneys include copaiba, oil of juniper, cubebs, oil of sandal-wood, etc. Oils which are used to aid digestion include oil of peppermint, anise, ginger, capsicum, nutmeg and cinnamon. Another group of essential oils are used in the treatment of hysteria on account of their peculiar odour. Valerian and asafetida are included in this group.

ETHER.—Ether is a colourless, highly inflammable liquid which is used as a general anæsthetic. (*See also* ANÆSTHETICS.)

ETHYL ALCOHOL.—Ethyl alcohol is what is known as absolute alcohol. (*See also* ALCOHOL.)

ETHYL CHLORIDE.—When absolute alcohol is treated with hydrochloric acid, a very inflammable liquid known as ethyl chloride is produced. Ethyl chloride produces an intense feeling of coldness when it is applied externally to the skin, and because of this it is sometimes used for small operations such as the removal of warts, etc. For this purpose the ethyl chloride is put up in small glass tubes with a fine nozzle attached. By warming the tube in the hand the ethyl chloride is forced out in a spray on to the skin and rapidly forms a thin coating of ice which freezes the area underneath it.

Ethyl chloride is also used to produce general anæsthesia for brief operations, and as it is very rapid in its effect it is especially useful for children. (*See also* ANÆSTHESIA.)

ETHYL FORMATE.—Ethyl formate, or formic ether, is a colourless liquid which smells rather like peach kernels. It is sometimes given internally in doses of one or two teaspoonsful in order to relieve pain and to produce sleep. It is sometimes used as a flavouring agent.

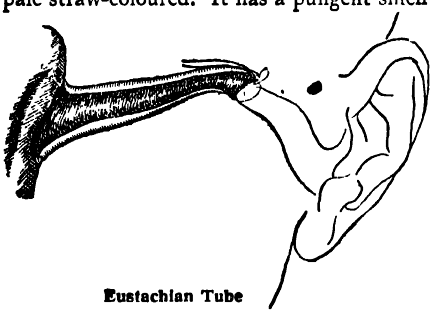
ETHYL NITRITE.—Ethyl nitrite is a colourless liquid which has much the same action on the heart as amyl nitrite. It has a peculiar odour, not unlike apples, and it is used in the manufacture of spirit of nitrous ether, commonly known as sweet spirits of nitre. (*See also* AMYL NITRITE; ANGINA PECTORIS.)

ETHYLENE.—Ethylene is a gas which has been used with oxygen to produce anæsthesia, but as its effects have not always been satisfactory, it is hardly ever used nowadays.

EUCAINE.—Eucaine is also termed benzamine, and it is a substance made to resemble cocaine, but is less poisonous than cocaine. It is used to deaden a small area of the body for short operations, especially in eye operations or for the extraction of teeth. When used in ointment form it relieves itching of the skin. (*See also* ANÆSTHETICS.)

EUCALYPTOL.—Eucalyptol is obtained from the oil of eucalyptus, and it is used as an inhalant in cases of bronchitis. It is less crude than oil of eucalyptus and is, therefore, less irritating to the mucous membranes.

EUCALYPTUS.—Oil of eucalyptus is distilled from the fresh leaves of several species of gum tree grown in Australia. The oil is almost colourless, but some varieties are pale straw-coloured. It has a pungent smell



Eustachian Tube

which is very clean and refreshing. The oil is extensively used in the treatment of colds and influenza and it is one of the most popular remedies for bronchial catarrh. It is generally used by placing a few drops on a handkerchief, but this is only helpful in cases of a slight cold in the head. When there is much nasal catarrh, the oil should be inhaled or sprayed into the nostrils. The oil, when mixed with an equal quantity of olive oil, may be rubbed into the skin as a remedy for rheumatism. Eucalyptus oil has been given during cholera epidemics, and it has also been used in the treatment of measles, typhoid fever, and worms. Owing to its powerful smell it is often used to hide other offensive odours and it is sometimes given by mouth to correct bad breath.

EUGENOL.—Eugenol is a colourless oily liquid used a great deal by dentists. It is the chief constituent found in oil of cloves.

EUONYMUS.—Euonymus is the root bark of the wahoo or spindle-tree. It is used as a purgative and is also given where it is required to increase the flow of bile.

EUPHORBIA.—This plant is also known as the Australian snake-weed or cat's hair, and it is made use of in medicine as a remedy for asthma, whooping-cough, and all bronchial troubles. The drug was first introduced by a man called Carr-Boyd in 1880 and became known as the "Queensland Asthma Herb." Another species of the plant commonly called pretty spurge or Devil's milk is used in the treatment of conditions in which there is extreme shortness of breath.

EUSOL.—Eusol is a solution of chlorinated lime and boracic acid and it should contain no less than 0·5 per cent. of hypochlorous acid. Its name stands for **E**dinburgh **U**niversity **SOL**ution, having been evolved in the laboratories at Edinburgh during the war.

Eusol is used as a general antiseptic lotion for cuts and wounds and was of great value during the Great War, when it was invented for that purpose. It could be easily applied as a first dressing on the field to prevent sepsis, and could also be applied dry as a powder when water was not available. Similar solutions are Dakin's solution, chloramine-T, and so on.

EUSTACHIAN TUBES.—From the back of the nose there are two small passages leading on each side to the middle ear. These are called the eustachian tubes. Their chief use is to regulate the amount of air which passes to the middle ear, which is a very important matter in connection with the hearing, since the amount of air in the middle ear affects the position of the drum, which should be held just taut, and neither pushed outwards by too much air or allowed to sag by too little air being present. If catarrh is present in the eustachian tubes, as in the case of a common cold, it may cause the lining of the tubes to swell so much that not enough air gets past and there is a slight degree of deafness as a result. A catheter can be passed into the tubes by an ear specialist in order to make a passage for air. This is called inflation by the eustachian catheter. If the catarrhal condition is allowed to become permanent and to spread to the inner ear itself, permanent and incurable deafness will result. This catarrhal deafness is the most common form of deafness which is not hereditary.

In order to prevent catarrh spreading from other conditions such as adenoids or

septic tonsils it is necessary to blow the nose properly. This should be done, not in the old-fashioned way of blowing vigorously down both nostrils at once, but by holding one nostril closed with a finger pressed on it while the other is blown gently. Then closing that nostril in the same way while the other is cleared. (*See also* EAR.)

EUTHANASIA.—This is the name given to the methods used to secure an easy and gentle death for persons suffering from some incurable disease. For example, it is usual for a doctor to try and give relief to a patient who is dying from cancer or some such painful disease by administering drugs, which have the power of producing sleep and mental ease.

EVOLUTION.—By evolution we usually mean the story of the steps by which any living being has acquired the form and character that distinguish it; that is to say, how it has developed to what it is, how it has evolved.

Where can we find this story? It is written in the rocks, in the fossils embedded in them, in our coal mines which are ancient buried forests, in bones that have been dug up, in the drawings made thousands of years ago by cave-dwellers—some of these drawings were found at Torquay, and in the remains of early man found in China, in Java and in Sussex. It is written too in a blade of grass, in the cat sitting by the fire, in an elephant, a horse, a rook, an eel, and in man himself. But no one can read the story without special knowledge and a trained mind.

The tall Giraffe.—Two thousand years ago or more the great Greek philosopher Aristotle wrote about the development of life. Other writers followed, and learned men have argued hotly on such questions as whether or not the chicken is in the egg, very small but quite complete, from the first; and indeed it is difficult to see how, without high-powered microscopes, they could do much but argue! The microscope, as we know it, with its great magnifying power, shows us wonderful things.

We must pass over a number of famous names and come to Charles Darwin, whose name everyone connects with evolution, chiefly on account of his book "The Origin of Species," which made a great sensation when it was published sixty years or more ago.

As a young man, Darwin went to Cambridge University with the intention of being a clergyman. But his tastes lay in science. He delighted in exploring the fens round Cambridge, and was very keen on making a collection of beetles. He was well off enough to make it possible for him to give his life to science, and in after years, looking back on his life, he wrote: "I believe that I have acted rightly in steadily following and devoting my life to science."

Darwin did not sit at home and imagine things about Nature. He did not, for example, suggest to the world, as another distinguished man of science did, without being able to prove it, that the giraffe got his long neck because generations of giraffes had had to stretch up to reach the topmost boughs of tall trees! Darwin spent years in observing and making notes before writing his books. For eight years he studied those curious little creatures called sea acorns and ships' barnacles, creatures that grow in such odd places as whales' and turtles' backs, on birds' feet, and even on one another. All kinds of life interested him. He studied worms, plants, and animals, and in this way he arrived at conclusions by which he explained, among other things, why certain birds and animals and plants have certain shapes and colours and habits.

Horses, Dogs and Oysters.—In paying a tribute to Darwin's memory, in 1909, the centenary of his birth, another distinguished man of science, Sir Ray Lankester, said it was a pity that some unknown writers in newspapers had cast doubt on Darwin's "celebrated and universally accepted theory of the origin of the species or kinds of plants and animals by natural selection, or 'the survival of favoured races in the struggle for life.'" Those who tried to belittle Darwin's work showed, he said, that they did not understand it. Darwin's work was not guess-work, but built up on observation, on three groups of facts that everyone admitted, facts that could be seen by those who used their eyes.

They are, simply put:—

(1) Living things, each in its kind, produce a far larger number of young than can possibly grow up to maturity, since the kind of food and the situation necessary to each kind are limited and already occupied. As an example, Sir Ray Lankester says that only

the oyster embryo out of every five million produced grows up through all the stages of youth to the adult state.

(2) Of all the young born to a pair of parents, no two are exactly alike, nor are any exactly like their parents, nor are any two taken from all produced by all parents of that species—or kind—exactly alike. They all resemble their parents at the corresponding age—we can notice this for ourselves, in our own family or our friends' families, but they are not exact copies of the parents. This is called "variation."

(3) Though there is this variation among all the offspring in each generation, the parents do give their young peculiarities of their own, and this too we may notice among our own circle of friends and acquaintances.

Having got so far, by observation, Darwin concluded that those "best fitted to get through the exceedingly numerous difficulties and dangers of life will be the survivors," in other words, the fittest come out top in the struggle for life. This is what is meant by "the survival of the fittest," or "natural selection."

"The theory of the natural selection of variations as the moving spring in the gradual development of living forms from simplest living matter is Darwin's theory," writes Sir Ray Lankester, and he adds, "No doubt we are learning and shall learn more . . . but such increase of knowledge has not tended to undermine Mr. Darwin's theory, and does not seem at all likely to do so."

That was written more than twenty years ago, and it is still true to say that while scientific men and women are always at work, nothing very striking has been advanced since Darwin's day, and the unfathomable mystery as to what life itself is, remains unsolved.

EXALGIN.—This is the trade name for methylacetanilide, a derivative of antifebrin. It is useful in the treatment of neuralgias of all kinds, but it should not be taken unless prescribed by a doctor.

EXCISION.—The operation of cutting out or excising any organ or part of the tissues of the body is often called an excision. An abscess is excised, or a breast which has to be removed is said to be excised. Any sort of a growth is excised and a joint may be excised; but, strangely enough, no one ever talks of excising the appendix—it is "removed." Nor the tonsils — which are "enucleated."

EXCITING CAUSE.—This is a medical term used for the immediate cause of a disease. The exciting cause of most diseases is infection with germs.

EXCORIATION.—This term is used to describe the loss of skin by rubbing or chafing.

EXCRETA or EXCRETIONS. — The excreta or excretions of the body are the waste products of the body which are naturally discharged by it into the outside world. They are the fæces, the urine and the sweat. They must be got rid of by the body if it is to remain in health, and the process by which they are got rid of is called *excretion*. They are said to be excreted by the excretory organs.

EXERCISE.—Exercise is necessary for us all from infancy to old age. We cannot be healthy without it and we cannot be happy. Very few people, especially amongst town-dwellers, get enough exercise for health from their daily work, and have to supplement the exertion they undergo in their work by special exercise, either in the form of sport or of gymnastic exercises. Some forms of deformity and ill-health require special exercises. A general review is made of the various forms which exercise may take both in health and disease in a special supplement called EXERCISE AND SPORTS.

EXOPHTHALMIC GOITRE or GRAVES' DISEASE.—This is a disease of the thyroid gland in which the most noticeable feature is that the eyes become prominent and bulging. It was first described by an Irish physician called Graves about a hundred years ago. It is generally found amongst young women between the ages of fifteen and thirty years. When men get it they are usually older, between the ages of thirty and forty-five years being the most frequent age. A sudden fright, grief, or shock, or the effects of a depressing disease or prolonged overstrain is a common starting-point for the disease, or, to be more correct, these disturbances may call it into activity. For a considerable time the patient may have had a feeling of weariness or exhaustion with no apparent cause, and have been nervous, irritable and restless.

Symptoms.—As its name implies there is a goitre or enlargement of the thyroid gland,

which lies on the front of the neck rather below the middle. The eyes become prominent in nearly all cases, but sometimes only in a very small degree. They may, however, protrude so much that the eyelids cannot be closed over them and the patient has a staring look. The white of the eye is visible all round the iris or coloured part. Sometimes only one eye is affected and in this case it is usually the right one.

The action of the heart is disturbed and the pulse becomes rapid with palpitation. The patient is anæmic and becomes nervous and irritable with tremblings of the muscles and sleeplessness. Usually there is a history of other forms of nervous diseases amongst other members of the family, such as hysteria, epilepsy or St. Vitus's dance. There may be other symptoms in individual cases such as disturbances of the digestion, variable and capricious appetite, attacks of vomiting; diarrhœa is fairly frequent, and loss of weight practically always occurs. Albumen and sugar may be present in the urine and more urine is passed than is customary, and more frequently than usual. The face is inclined to flush easily and there is much sweating and sometimes feverish attacks. In most cases the skin becomes browner than usual. It may be "tanned" all over or there may be brown patches on the cheeks. The hair becomes thin and poor and the nails brittle. The teeth tend to decay early in the course of the disease. There is always a good deal of nervousness which may go on to serious melancholia and depression.

Treatment.—The treatment of exophthalmic goitre is primarily mental and physical rest. In severe cases the patient must be confined to bed, but a warm "stuffy" atmosphere is very injurious. The room should be light, sunny, and very well ventilated. A patient who is up should rest out of doors as much as possible. The diet should be chosen from among easily digested foods and should be liberal and nutritious. Red meat and alcohol in all forms should be avoided; also coffee and strong tea, which act as stimulants, and in these cases increase the tendency to insomnia and nervous symptoms. Freshly-made weak tea is allowed, but pickles, spiced foods, chocolate, oatmeal and tobacco are generally forbidden.

Any sources of poisoning such as decayed teeth, diseased tonsils or nasal sinuses must be attended to. Iodine in milk is useful in some cases but others do not take it very well, and it should only be taken under a doctor's supervision. In urgent cases, where the heart or eye symptoms are very bad and the patient must continue at work for a living, the question of operation may have to be considered.

The thyroid gland itself is treated in various ways. There are two chief methods of operation: one consists in tying the arteries which supply the gland, and by thus starving it, diminishing the secretion. The other consists in removing part of the gland. Exophthalmic goitre has its ups and downs, and the operation is generally performed when the disease is fairly quiescent. Crile, the American surgeon, performs an operation which he calls "stealing the goitre." The patient is prepared for operation for a few days, until the routine is familiar and no longer causes apprehension. Then one morning she is given a sedative, followed by an anæsthetic, and recovers to find the operation over. This method is said to prevent the nervous symptoms which sometimes increase at this time. X-ray and electrical treatment are also frequently used.

EXOPHTHALMOS.—Protruding eye balls. (*See also* EXOPHTHALMIC GOITRE.)

EXPECTATION OF LIFE.—Every now and again a newspaper will announce the birthday or death of someone who has lived to be one hundred years or more. These are, of course, exceptions to the general rule; but there is no doubt, from the official figures for our own country, that the length of life of both men and women—but women more than men—has increased during the last fifty years. It has been estimated that fifteen years have been added to life in that period.

With regard to the difference between the expectation of life of men and women, it is well known that more girls survive the first year of life than boys. Boys, it is often said, are more delicate, more difficult to rear. Men, too, are supposed to run greater risks to life than women. It will be interesting to see whether the daring of women gymnasts and aviators is going to affect the estimates of the future!

It is when applying for an annuity that this difference is brought home to us. The amount payable on premiums is calculated on the expectation of life of men and women,

and there may be as much as a couple of pounds difference on every hundred, owing to men not being expected to live so long as women, who therefore receive less. It is cheering for the annuitant, if not for the company paying the annuity, that annuitants are notoriously long-lived!

Two interesting facts about these figures are that not nearly so many people die under fifty years of age as formerly, and that there has been of late years a great reduction—"amazing," Sir George Newman, the Principal Medical Officer of Health, calls it in his latest annual report—in the number of deaths of infants and children. Much of the credit for this must be given to the excellent work of the welfare clinics which have sprung up all over the country.

EXPECTORANT.—Any drug which aids the removal of catarrhal matter and phlegm from the bronchial tubes is called an expectorant. These drugs are not all alike in their way of acting upon the body; in fact, some have a very complicated mode of action. The only direct expectorants are those which can be inhaled as a vapour, thus causing the drug to come into close contact with the inflamed bronchial tubes. In this group are included the balsams such as Friars' balsam and balsam of tolu, eucalyptus, menthol, turpentine and benzoic acid.

An indirect expectorant is taken internally and its action is carried out by the blood circulation. Some drugs, such as senega and squills, are termed stimulating expectorants because they increase the flow of blood which in turn increases the amount of expectoration in the bronchial tubes and so aids its removal. Ipecacuanha is a valuable expectorant. especially in a dry cough, as it causes an outpouring of soothing sputum in the throat and gives great relief. (*See also* Bronchitis; Cough.)

EXPECTORATION.—This is the medical term used for material which is coughed up from the chest, or for the act of bringing it up. The term sputum is more commonly known for anything which is spat out from the air passages. Expectoration may vary a great deal in character and quantity in accordance with the state of the lungs. (*See also* Bronchitis; Consumption; Sputum.)

EXTRACT.—A large number of drugs in medicine are used in the form of an extract which is a concentrated preparation of the active part of the crude drug. Extracts are made by several methods. Some drugs are treated with boiling water and allowed to evaporate until the proper strength is reached; others are treated with alcohol or ether. (*See also* Drugs.)

EXTRAVASATION.—This term means the escape and flowing over into the surrounding tissues of any of the fluids of the body that are contained in an artery, or any vessel such as the bladder, etc. Extravasation is usually the result of a rupture, which may be brought about by injury or disease, or the break in the walls of a vessel or organ may be caused by internal pressure.

Blood is the most common fluid in the body and it is by far the commonest to be extravasated. A good example of this is an ordinary bruise which shows the discoloration of the surrounding tissues owing to the blood escaping from the ruptured blood-vessels. Extravasation of urine takes place when the bladder or the urethra is ruptured, and bile may be extravasated from the intestinal tract owing to perforation. (*See also* Bladder; Bruise; Hæmorrhage.)

EXTREMITY.—The word extremity is generally used in connection with the arms and legs. The arms are termed the upper extremities and the legs the lower extremities, but the word may be applied to the hands or feet.

EXUDATE.—Exudate is the name given to pus or matter which exudes or comes from an inflamed area or from a septic wound. Exudates are found in large quantities in cases of pleurisy, which is an inflammation of the pleural cavity, or in the pericardium in pericarditis. (*See also* Emphysema; Pericarditis; Pleurisy; Sepsis.)

EYE, THE. Description.—The apparatus by which we are enabled to see consists of the *eye* itself, the *optic nerve,* which is the special nerve supplying the eye, and the *occipital lobes* of the brain, which lie in the lower part of the back of the skull. The eye forms pictures of objects looked at, the nerve passes them on to the brain, and these receive the picture-messages and interpret them.

The *eyeballs* (*see* illustration on page 281) each lie in a bony cavity in the front of the skull called the *orbit.* The eyeball is, roughly speaking, a round ball with a slight bulge in the front, which is the *cornea.* This is the membrane through

which we see; the window of the eye. It covers the *pupil* and *iris*. The pupil is the round black part of the eye, and is simply a hole in the centre of the iris, which is the coloured part of the eye. The *sclerotic*, or white of the eye, surrounds the pupil and iris. The cornea is, in health, a perfectly transparent membrane, through which the light passes. The sclerotic and the cornea together form the first coat of the eye. The sclerotic is composed of thick white fibrous tissue. Each eyeball is divided into two parts. First, a large division at the back, called the posterior chamber, which is filled with a perfectly clear jelly (*vitreous humour*), and secondly, a smaller division at the front, called the anterior chamber, which is filled with a clear watery fluid (*aqueous humour*). The division between the two chambers consists of the *lens* and the structures which hold it in place.

The *iris* or coloured part of the eye lies behind the cornea. It consists of a circular curtain of delicate muscle fibres, with the *pupil* in the middle. The muscle fibres are arranged in two layers; a circular layer, arranged in rings, which when it contracts makes the pupil smaller; and a radially arranged layer (i.e. the fibres stretching from the pupil to the outer edge of the iris) which on contracting makes the pupil larger. The use of these muscles is to permit the required amount of light to reach the eye—more in a dim light, less in a bright light—so that the delicate retina shall not be damaged. The colour of the eye depends on the amount of colouring matter in the iris.

Lens.—Immediately behind the iris lies the *lens*, which is formed of transparent crystalline material. It is curved outwards at the front and rather more so at the back. It is held in place by a transparent membrane called the *capsule*, which encloses the lens, and passes off as the *suspensory ligament* to be attached to the *ciliary* processes (which will be described later). To use a rough illustration, the lens may represent a person, the capsule a hammock, the suspensory ligament the ropes holding it up, and the ciliary processes the apple-trees to which the hammock is slung. To make the illustration more correct, one should imagine a circular body in a circular hammock which is slung by ropes from all sides to trees growing in a circle. The suspensory ligament and the lens form the partition between the anterior and posterior chambers of the eye. The suspensory ligament passes to the back of the ciliary body; on contraction of the ciliary muscle the ligament is relaxed and the lens becomes more convex, or, in other words, bulges rather more.

Choroid.—The second coat of the eye is formed of the *choroid*, which is black owing to its containing much colouring matter; it also contains a large number of blood-vessels. As it passes forwards to the front of the eye, just within the edge of the white, the choroid is thickened and raised into numerous ridges called the *ciliary processes* or *ciliary body*. This forms the thickened circular front edge of the choroid coat and consists of blood-vessels and circular muscles, which by their contraction tend to lessen the ring of the ciliary body, and so cause relaxation of the suspensory ligament of the lens. The iris is a continuation of the front part of the ciliary body.

Retina.—The third coat of the eye is that formed by the *retina*. This consists of a very delicate layer of cells forming the ends of the optic nerve fibres. These enter the eye at the back in a fairly large bundle, and then spread out in all directions so as to cover the choroid with a pale delicate membrane. The structure of the retina can only be made out with the microscope, and is very complicated. It is in the retina that impressions of sight are started. All points on the retina are not equally sensitive to light, and one point is totally insensitive, namely, the place where the optic nerve enters. The mid-point, or very near, is the most sensitive. On examination, it may be seen as a yellowish area and is called the macula lutea, or simply the *macula*.

Eyelids.—The eye is protected in front by the eyelids, which consist of a fold of skin strengthened by a very thin piece of cartilage, and lined by a thin transparent membrane, called the *conjunctiva*. When this reaches the inner margins of the lids it is folded on itself to cover the white of the eye as far as the cornea. It contains many glands which produce mucus; this acts as an oiling fluid, and thus enables the eyeball to move easily and without rubbing in its socket.

Tear Gland.—The eyeball is also oiled by the *lachrymal* or *tear gland*, which lies in the outer and upper part of the orbit. The

tears bathe the front of the eye, and then flow away through two little tubes, called *canaliculi.* The entrances to these are situated just opposite to each other on the corner of the eyelids near the nose. They enter the side of a little bag, called the *lachrymal* or *tear sac*, which drains into the nose. If the tears are produced too rapidly, they flood the tubes and overflow on to the cheeks.

How the Eye works.—The work of the eye is to take pictures of external objects, and convey them to the brain. It acts practically as a camera. The white of the eye is the box; the choroid is the black lining which prevents the reflection of light, which would spoil the clearness of the picture; and the retina is the sensitive plate which records the picture. The iris acts as the stop, which regulates itself automatically, and, as in the camera, is regulated by the photographer: in a poor light it is opened widely to allow as much light as possible to enter; in a bright light it is made smaller. The lens brings together the light rays so that they come to a point on the surface of the retina, or plate, and so form a clear image.

It is done in this way: if a ray of light passes from one medium to another; for instance, from air into water or glass, the light rays are bent at an angle. (This is easily understood if a stick is held straight down in a foot or two of water; it appears to bend as it enters the water.) Also, on leaving a medium, the rays are again bent. This bending is called *refraction.* If the two surfaces of the second medium are parallel to one another, as in a window-pane, the direction of the rays on leaving is also parallel. If the glass is curved, and the curves are of a different degree, or are in opposite directions, the rays converge (come together), or diverge (part) as they leave the glass. Thus, in an ordinary magnifying-glass, the two surfaces are curved in opposite directions, forming what is called a convex lens, and it is found that if parallel rays of light enter such a lèns at one surface, they tend to bend towards each other as they leave the lens from the opposite side, and meet in a point. This is known as the *focal point*, and rays of light are said to be *focused* at that point. (This has been made use of for many years in the "burning-glass.") The focal point, of course, varies in distance from the lens according to the degree of curvature of the two surfaces of the lens.

In the eye, refraction of light occurs not only in the lens itself, but in all the structures it passes on the way to the retina—the cornea, the aqueous humour, the lens, and the vitreous humour. It is clear that, as the various objects seen are at various distances from the eye a fixed refraction of these substances will not be correct for all objects. In a camera, a correct focus is obtained by moving the screen towards or away from the lens; in the eye this cannot be done, and the only refracting medium that can be altered is the lens. The curve of this is changed by the contraction or relaxation of the ciliary muscle, to which the lens is attached. As the lens is not a hard body, but pliable and elastic, if the capsule is tightened the lens is flattened, and if it is "slacked off" the lens becomes thicker, and objects at any distance are focused clearly.

This alteration in the length of focus of the eye is called the *accommodation*; it is accompanied by alteration in the size of the pupil, which enlarges when near objects are looked at, and contracts for distant objects. If the accommodation is faulty, myopia (short sight) or hypermetropia (long sight) occurs. Presbyopia (old sight) has the same effect as long sight; it is a perfectly normal change which comes on in middle life, and is due to gradual hardening of the lens.

The eye is moved by six muscles. Four, which are called the recti or straight muscles, arise from the back of the eye-socket, and are attached respectively into the upper, lower, inner and outer sides of the eyeball. The other two muscles are called oblique, because they are attached to the sides of the upper and lower parts of the eyeball. Squint is caused by one muscle being too short, over-acting when used, or being paralysed.

In order that man, although provided with two eyes, shall see only one image of any object, a very exact working between the muscles of the two eyes is necessary. To ensure this, the nerve supply and action of the muscles is so arranged as to cause both eyes to move at once in the same direction. If for any reason this power is interfered with, the eyes move at slightly different times, and a double or blurred image is produced.

Very few of the lower animals possess this power of binocular vision, as it is called, as

their eyes are not facing in the same direction. The eyes of man are able to do this; the eyes being slightly distant from each other produce a slightly different image, and this gives an appearance of solidity to the object. This is shown by the stereoscope; a single photograph normally gives a "flat" effect when looked at, but when two copies of the same photograph are placed side by side and viewed at once and independently by each eye, a "solid" effect is obtained.

Binocular vision also enables man to judge distances; a man who has lost the sight of one eye suffers the handicap of being unable to do this with any accuracy.

Diseases of the Eye are described separately under the headings BLACK EYE; BLINDNESS; CATARACT; CONJUNCTIVITIS; ECTROPION; ENTROPION; EYE, INJURIES OF; EYE-LIDS; GLAUCOMA; IRITIS, etc.

Injuries of the Eye.—*Every injury of the eye, however slight, should have immediate attention,* which not only may make the difference between blindness and sight in the injured eye, but may prevent "the appalling danger that blindness of both eyes may be the result of an injury to one of them." No first-aid treatment beyond that suggested should be attempted, and hands, dressings, etc., should be scrupulously clean.

Foreign Body.—The most frequent accident that happens to the eye is the entrance of a foreign body. This causes considerable pain; the eye waters freely; and sometimes, if the nose is sharply blown, the foreign body will be dislodged and washed away. The eye should not be rubbed. If it is within the lower lid, it is easily removed by the corner of a clean handkerchief.

Frequently, however, the foreign body "wedges itself" under the upper lid. The *first* method of removal, which is especially useful in the case of children or nervous patients, is to introduce a drop of castor or olive oil into the eye. This may entangle the foreign body and float it out. A *second* method is to pull the upper eyelid out gently, then push up the lower lid under it and let go. As the lid descends, the eyelashes brush the inner surface of the upper lid, and may dislodge the foreign body. The *surgical* method is that of *eversion,* or turning-out of the upper eyelid. This is not a simple thing to do, but in reality needs considerable care and skill, and even in expert hands, is an unpleasant procedure. It should, therefore, not be often attempted by the amateur.

A foreign body may wound the covering of the eyeball and remain there without penetrating the eye. This is a frequent accident among coal-miners and engineers. No attempt should be made to remove the foreign body; the patient should be taken to a doctor immediately.

Bruise of the Eye.—The eye may be bruised by such things as a piece of wood or coal, a snowball, a cork, etc. The eye is red, waters copiously, and light hurts. The treatment is simple; it consists in rest and an eye-shade for a few days.

If the bruise is severe, damage varying in severity may be done to the inner parts of the eye.

Wounds of the Eye.—These are naturally of very various kinds, according to what instrument has produced the wound, what parts of the eye are damaged, and whether or not the instrument remains within the eye. For instance, the wound may have been caused by some such thing as a gimlet, pitchfork, cow's horn, "tipcat," etc., or it may have been due to some small sharp rapidly-moving object such as a chip of metal, stone, or glass which has remained in the eye.

There are two dangers which are to be feared: first, infection of the wounded eye; secondly, inflammation of the sound eye, which is most serious, as it may result in blindness. In severe cases of wounds of the eye, especially where there is injury of the surrounding parts in addition, the patient may show signs of collapse.

The *first-aid* treatment is to cover the eye with a pad of boric gauze, soaked in warm boiled water, and apply a bandage. Collapse, if present, should be treated, and the doctor called in immediately. The *surgical* treatment depends entirely on what part of the eye is involved; each case is treated "on its merits." When the foreign body remains within the eye, it must at all costs be removed. "An eye with a foreign body in it is lost and so is the other eye." In 75 per cent. of cases the foreign body is a fragment of iron or steel, which is removed by an electro-magnet. An eye which is hopelessly damaged should be removed, or the sound eye may inflame. and sight be lost completely.

Unequal pupils, Anisocoria.—In this condition the pupils of the eyes differ in size. The causes are various: the uses of a drug which temporarily causes the pupil of the eye to expand, a marked difference in the strength of the eyes, one-sided blindness, and local injury. General causes may be: aneurysm, tuberculosis at the apex of the lung, dental disease; diseases of the nervous system, of which locomotor ataxia, general paralysis, and multiple sclerosis are the commonest. It does not of course follow that every sufferer from one or other of these diseases has anisocoria. It may also occur in healthy people and then has no special significance.

EYE, ARTIFICIAL.—After the operation for removal of an eye has been performed, it is usual for a patient to wear an artificial eye. This may first be used about a month or six weeks after the operation; if the eye has been removed on account of injury or a tumour, and there has been little previous inflammation, the socket soon becomes "hardened"; but if there has been much previous inflammation, naturally a longer time must elapse before an artificial eye can be worn with comfort. The hardening process is hastened if the patient will—as soon as the surgeon advises it—expose the socket to the air as soon as possible.

An artificial eye is a thin shell of glass made to resemble as closely as possible the front part of the other (sound) eye. Not only is the size of the eye and the colour of the iris considered, but the exact shade of the white is matched, and the pupils are matched in size. It is advisable to choose an eye which is slightly smaller than the normal one; an eye which is exactly the same size, which a patient may think looks less artificial, often produces just the very effect he desires to avoid. It tends to press the lower lid too far downwards, and to "stick" in the socket instead of moving freely with the other eye.

To put in the eye, it should be held between the finger and thumb, and the larger portion of white passed under the upper lid; then the lower lid is drawn down, the eye gently rolled downwards, and it will slip into place. To remove the eye, the lower lid is drawn down, and a small blunt "lifter" (the bent part of a hairpin is very convenient) gently pushed underneath it, and the eye held between this and the thumb. Then by a slight rolling movement it is removed, the upper part last. It is safer to lean forwards over the bed when taking out the eye, so that it is not broken if dropped. It should be removed every night, and well washed and dried. It should *not* be left to soak in water or disinfectant fluid, as is sometimes done. The socket is also well washed out every night, and a weak astringent (drying) lotion or drops used.

The washing of the tears over the eye gradually dulls it, so that after about a year it will need re-polishing. It is best, if one can afford it, to have two or three artificial eyes in use, so that in case of breakage or re-polishing one is not left destitute.

Another and newer form of artificial eye is made in the shape of hollow eyeballs, which are flattened behind. These are said to be more comfortable than the older type on account of the rounded edge, and to look more natural, as they do not have the "sunken" appearance characteristic of the flat artificial eye. The old type, however, is still considered better to wear when there is still a shrunken natural eye in place in the socket, or when only a partial removal has been carried out.

EYE-BATH.—The best way to apply a soothing lotion to the eye is by means of an eye-bath. The best type is made of glass and should be shaped to fit the eye. The glass should be filled with warm boracic lotion and applied to the eye while leaning over a basin. The eye must be kept open as wide as possible and the head tilted well back. The rim of the eye bath should fit the socket of the eye so that while the head is tilted backwards no lotion is able to escape. This should be repeated several times with fresh lotion.

EYEBROWS, THE.—The eyebrows consist of ridges of slightly thickened skin, covered with strong hairs; these are so arranged that the sweat from the forehead shall not trickle into the eyes and obscure or irritate them. Another useful purpose they have is shown by the way they are immediately drawn down as a protection when the eyes are exposed to strong light.

The eyebrows give much expression to the face: their movements can express thought, incredulity, annoyance, surprise, contempt, and so on, almost as plainly as by words. The word "supercilious" is derived from

the Latin "supercilium," an eyebrow. The blank countenance caused by the fashionable plucked eyebrows is a study in contrast.

The eyebrows are one of man's prerogatives. Some birds have specially arranged feathers above the eyes, and the seal has a few stiff hairs; but no animal, not even the higher apes, can lay claim to true eyebrows.

EYELIDS, THE.—The eyelids are made up of four sorts of tissues: the skin; the tarsus or "cartilage," which gives strength to the eyelids; muscles, which control their movements; and the conjunctiva, the thin moist membrane lining the eyelids. They act as a protective covering for the eyes.

The skin of the eyelids is finer than the ordinary skin of the body; it has no hairs (except the eyelashes), and no sweat-glands. It is not firmly attached to the tissues underneath, as is the body skin, but moves easily over the tarsus. One result of this is that the blood-vessels below can be easily damaged, and that the blood flows out rapidly—hence the speed with which a "black eye" appears after a blow; or fluid swelling of the lid arises in various acute conditions of the face, or in general diseases such as Bright's disease.

At the edges of the lids are the eyelashes, which are most important in that they keep the eyes free from foreign bodies, both solid and liquid, and also from the germs of disease. "It is interesting to place a drop of water on the outside of a person's upper eyelid and watch it lying on the eyelashes without entering the eye; it is a demonstration of the perfection of the screen formed by the lashes." Behind the lashes are glands which produce an oily or waxy fluid; this does not mix with the tears, but helps to prevent them from running over the margins of the lids and down the cheeks.



Magnet for Extracting Metallic Foreign Body from the Eye

The tarsus or cartilage of the eyelid allows the lids to be closed without puckering or turning in upon the eye. They are curved to the shape of the eye. Their importance is perhaps more readily understood in cases of disease when, owing to various causes, they press upon the eye, or cannot prevent the eyelids turning outwards, or in upon the eye.

The eyelids are moved by two muscles, one of which passes round both lids, on the outside of the tarsus, and opens and closes the lids as required. The nerve to this muscle is the facial nerve, and when this is paralysed the lower lid hangs down, and tears run over the cheek. (*See also* ECTROPION.) The other

muscle, or "lifter of the upper eyelid," is the muscle which carries out the involuntary blinking of the eye. This allows the moist inner surface of the upper eyelid to sweep the eye and keep it from becoming dried by exposure to the air, or injured by other organisms. It is supplied by the "eye-mover" nerve, so that *blinking* and *closing* the eye are carried out by two different mechanisms.

When the eyelids are closed in sleep the upper and lower lids exactly meet, so that the eye is protected and kept moist. At the same time the eyeball turns upwards, still further to protect the eye from possible injury.

The conjunctiva and the tear apparatus are described, together with their diseases, under their own headings.

Injuries of the Eyelids.—These are treated on ordinary surgical lines, great care being taken in the "repair" of the lids that as little deformity as possible is left. In every case, especially in burns, care is taken that the eyeball is not left exposed, or there is grave danger to the sight. (*See also* BLACK EYE; BLINDING FROM LIGHTNING; BURNS OF EYE, ETC.)

Sore Eyelids or Blepharitis.—Here sore eyelids denote a scaly, crusted, or ulcerated inflammation of the margin of the eyelids. It occurs in people of any age, but especially in delicate children, and seems almost invariably to be associated with a debilitated condition, whether local or general. It is often less important in itself than as a sign that something else is wrong. The conditions which it usually accompanies are, briefly, chronic diseases of the eye, nose and ear, especially those of a catarrhal nature; also chronic skin diseases, malnutrition, anæmia and some cases of tuberculosis. Eye strain (such as in uncorrected long sight), and exposure of the eyes to dust, cold winds, infected air, and so on, are also causes. In rare cases it is caused when the eyes are being treated by various drugs for some other condition.

To cure this condition may require several months, and it generally returns again.

Treatment.—The first and most important thing is to remove the cause: since local treatment alone will be useless. Every effort should be made to improve the general condition of health, which is, as has been said, invariably below par. Good food, plenty of sleep, fresh air day and night, a daily warm (not hot) bath and a brisk rubbing with a rough towel afterwards, exercise, arranged to suit the individual, regulation of the bowels, and so on, should have most careful attention. Tonics are very useful, those containing iron, arsenic, and strychnine being the most valuable. Cod-liver oil is also excellent. The eyes should be examined, and glasses should be worn if necessary.

As regards local treatment, this should always be under medical direction, though the patient may help greatly by following instructions as to bathing the eyes and by perseverance in treatment. The patient should, with as great attention to cleanliness as possible, bathe the lid margins several times daily, to remove all crusts and scales. Warm water which has been boiled may be used, or a weak solution of bicarbonate of soda. Warm boric lotion, very weak, may be applied after all crusts are removed, then an ointment. A stimulating ointment such as that of the yellow oxide of mercury does a great deal of good. In very obstinate cases the lid may be treated (by the doctor only) with a silver preparation, such as argyrol or protargol. Care must be taken that the lachrymal (tear) apparatus is in good order.

Chronic inflammation of the eyelids may lead to injury of the roots of the eyelashes, or to deformities of the lids.

When the whole eyelid is inflamed as well as the margins of the lids the condition is called *Tarsitis*. The whole lid is thickened, heavy and swollen. In rare cases, the inflammation grows quickly worse, and here the danger is that the cartilage of the eyelid will suppurate and slough or come away, so that the lid will remain as a lax flap. The eyelashes are generally lost in these cases. The treatment is the same as that of an abscess—opening and hot boric fomentations.

The chronic form is much more common, where the inflammation is mild and almost inactive. It is very resistant to treatment. It may follow on from inflammation of the margins of the lids or from conjunctivitis. Locally, the lids should be massaged regularly with ichthyol ointment, or "golden ointment." The general health should be most carefully regulated, as poor condition has a great deal to do with keeping up the

disease. Any other disease present should, of course, be treated. *Tarsitis* takes a very long time to cure, but is curable if the patient will only persevere with treatment.

Twitching Eyelids or Blepharospasm.—There is often a twitching or fluttering of the eyelid, caused by spasm of some or all of the fibres of the muscle which controls the movements of the eyelid. It is caused by irritation, such as "grit in the eye"; eye-strain, especially in uncorrected long-sight. It may also be due to irritation from decayed teeth; ear, nose and throat diseases; intestinal worms, neuralgia or nerve tumours, "habit spasm"; chorea (St. Vitus's dance); and, very often, mental strain and debility.

Treatment.—The treatment should aim at correcting the cause. A careful general examination should reveal any cause of irritation, and this should be treated. Faulty hygiene should be corrected, and, especially in nervous and debilitated patients, plenty of rest should be ordered. Tea and coffee are forbidden by many physicians, as they are apt to excite the nervous system.

In some cases the patient may be able to prevent the twitch and he should be encouraged to do this. Pressure on certain points sometimes gives relief: for example, just above the eyes. Electrical treatment and various injections have been tried; but in most cases the condition is not serious enough to require anything beyond regulation of hygiene and correction of any irritating cause.

Swelling of the Eyelids.—Swelling of the eyelids occurs from many causes. Damage, acute inflammation, and other diseases in the neighbourhood of the eye all cause swelling; these, however, are discussed elsewhere, and are accompanied by the other signs of inflammation, or at least of irritation—redness, heat, tenderness and pain. Sometimes, however, the eyelids may swell without any other symptoms.

Such swelling is frequently seen in a mild form in elderly people, and is due simply to weakness and loosening of the tissues, not to any disease.

Swelling of the eyelids which occurs in the morning, and gradually passes off during the day, always suggests Bright's disease, which may occur in various forms at any time of life. A person with this form of swelling should always be carefully examined by a competent medical man, as a mild degree of Bright's disease may, if it is not attended to, become very chronic.

"Cold œdema" is a curious condition which is at present not understood. It attacks both upper and lower lids on both sides; sometimes the swelling is so great as to suggest erysipelas, but there is neither redness nor fever. It is rather like the white swelling seen in Bright's disease, but is much greater, and does not lessen as the day goes on. Sooner or later, the eyes become almost closed up. No external treatment has any effect. Operations to remove some of the eyelid tissue have been performed; but are only temporarily successful. Lately, injections of alcohol into the tissues have been tried and are said to have produced a cure in some cases.

Puffy Eyelids.—If there is injury to some of the bones of the nose, into which the tear-ducts or "drains" open, so that the air can pass from the nose into and between the tissues of the eyelids, these may become puffed up with air, and on touching them a peculiar crackling sensation is felt. This generally comes on when the patient first blows his nose after the injury, to get rid of the blood.

Treatment.—A firm pad and bandage is put on over the eye, so that the air will be gradually pressed back into the nose; and the patient is told not to blow his nose for two or three days.

Herpes or Shingles is fairly frequent on the face. It begins in the usual way by the patient's complaining of neuralgia, in this case on one side of the forehead and in the eye. After a day or two a crop of little blisters, called vesicles, appears on the forehead and scalp, on the eyelids, down the nose on the same side, and possibly on the cornea (the transparent membrane in front of the eye). If this is attacked, the eye may be badly damaged. (*See also* CORNEA.)

Treatment.—The skin vesicles should be protected from infection by a dusting powder or ointment which contains menthol and cocaine, in addition to the usual treatment for shingles. (*See also* STYE.)

Skin Diseases of the Eyelids.—The skin of the eyelid may be attacked by any other skin disease which is present on the face; these are treated by the usual methods, and only a few points need special mention.

In *eczema*, lotions should not be used on

the eyelids, as they may possibly be dropped into the eyes, and so cause irritation. Ointments are used instead.

Erysipelas on the face frequently causes swelling of the eyelid so great that the eye is closed. In itself, the swelling need cause no alarm, but suppuration sometimes occurs, which may lead to sloughing or casting off of the eyelid, or extend to the eye, and so for various reasons cause blindness.

An *abscess* may occur on the lid, and is treated in the usual way. The swelling of the lid may in this case be very great in comparison with the seriousness of the condition; but it should always be treated with care in view of the possible danger to the sight.

Chalazion, Tarsal Cyst. — This is a disease of the eyelids which is frequently mistaken for a stye. It is caused by the blockage of a gland, the contents of which are prevented from escaping, and a cyst appears on the eyelid. It is about the size of a small pea.

It differs from a stye in that the hair-bulbs on the eyelid are not affected; the cyst "points" on the under surface behind the eyelashes, and appears as a bluish inflamed spot. It is readily infected by germs, forms a tiny abscess, which bursts, and then heals, but often leaves a thickened wall.

Treatment.—If the cyst is small, and there is no gathering it may be gently rubbed with an antiseptic ointment such as a mild mercury, or a weak iodine ointment. This is not a certain cure, but may with patience and time bring about a good result. A quicker method is to have the cyst removed by a small operation. (*See also* STYE.)

Eyelids which do not meet, or Lagophthalmos.—This is the condition in which the eyelids do not meet, either during sleep only, or because of disease.

It is very frequently seen in young infants asleep, and then requires no treatment, as it passes off after the first few weeks. Care should, however, be taken that nothing can touch the eyes, or damage may be done.

Sometimes the lids are too short, and cannot meet, either from an error in development, which is rare; or from disease, a burn or other injury.

Treatment.—This varies with the cause of the condition. If the lids are too short, either naturally or from injury, the only treatment is to keep the eye clean and moist by regular bathing with a mild boric lotion. If there are other conditions present, such as blepharitis (inflammation of the lid margins) or any skin disease, these should be treated, or an operation may be performed.

Distichiasis and Trichiasis.—True distichiasis is a natural deformity of the eyelashes, in which a second row of fine delicate hairs is found behind the normal lashes. As a rule, they cause no trouble, and should be left alone, unless they start growing, when their treatment should be as below.

Distichiasis is also seen in some diseases; in cases of persistent irritation of the conjunctiva, possibly after marginal inflammation, burns, or injuries, but most often in cases of trachoma (granular conjunctivitis), where the fine hairs are stimulated to unnatural growth. With this is also seen *Trichiasis,* which denotes a faulty position of the eyelashes: because of the scarring and shrinking of the conjunctiva, one or more of the eyelashes, perhaps the complete row, are drawn backwards till they come into contact with the eye.

Treatment.—It will readily be seen that a patient so afflicted will be always in a state of miserable discomfort. If only one or two lashes are at fault, these may be removed by forceps. If more, the lashes are destroyed by electrolysis. If the whole row, together with the lid edge, is turned in, an operation should be performed to put matters right. (*See also* ECTROPION; ENTROPION.)

EYESIGHT REQUIREMENTS NECESSARY FOR PUBLIC SERVICES.—It is well known that candidates for the various public services must undergo a medical examination. What is not so well known is that in most cases eyesight tests are included, and disappointment has been caused to many candidates who are not aware of this, and whose eyesight falls short of the set requirements. It is therefore hoped that the subjoined list may be of use. (The precise *degree* of faulty vision allowed in certain cases is not given; that is a matter for the oculist.)

Royal Navy.—A naval cadet must possess perfect vision, both for distant and near objects, without glasses. Colour vision must be perfect. Squint, chronic inflammation of the eyelids, or other such faults of the eyes, *whether past or present,* disqualify.

Army.—Candidates for Commissions are classified under three standards: (1) requires

perfect vision in both eyes; (2) requires perfect vision in one eye, and the second must be capable of considerable correction by glasses; (3) requires that one eye shall be capable of perfect correction, and the other of considerable correction, by glasses.

Glasses are allowed, but only a small degree of *short-sight* is permitted. The colour sense is tested, but colour-blindness does not necessarily involve rejection.

Air Force.—It is preferred that vision be perfect; but in rare cases the very smallest degree only of faulty vision may be accepted. Colour vision must be perfect, and the field of vision not decreased.

British Mercantile Marine.—The regulations here have not been laid down exactly, but a very high standard is required. One eye must possess perfect vision; a slight degree of imperfection may be allowed in the other. Glasses are not permitted. Colour vision must be perfect.

Police.—Distant vision must be perfect, and glasses are not permitted. Near vision (as for reading) is not tested; nor is there a colour vision test. Squint, inflammation of the eyelids, or any other eye troubles disqualify.

Railway Service.—There is an eyesight test for all candidates, but whereas some degree of imperfection is permitted to clerks, etc., and glasses allowed, other grades, e.g. engine-drivers, must possess perfect vision and colour vision must be perfect. These grades are periodically re-tested, so that the high standard may be maintained.

'Bus Drivers.—At present; drivers of public vehicles are only required to conform to the low standard laid down by the driving licence, i.e. to be able to read a moving number-plate at 15 yards distance. There is no test, so that a one-eyed or colour-blind driver is not debarred.

Civil Service, including Post Office.—There are no definite regulations, each case being tested "on its merits." Imperfect vision incapable of correction by glasses would, of course, disqualify.

Indian Civil Service.—Glasses may be worn, if necessary, but the corrected vision must be perfect in one eye, and only the slightest degree imperfect in the other. Only a slight degree of short-sight is permissible. There must be no disease of the eyes, and a squint that is at all serious disqualifies.

Teaching under Education Committees.—Glasses may be worn, but the correction obtained must be high. A moderate amount of short-sight, *capable of correction*, is allowed. but astigmatism (q.v.) of more than a slight degree disqualifies.

Public Libraries.—No sight test required.

Medical Officers.—No sight test required, except for the Indian Medical Service, when the requirements are as for Army Officers.

As a final note, it may be interesting to add that candidates for the *Church*, the *Law*, *Parliament*, or the *Universities* not only have no sight test, but that the totally blind (if their circumstances permit) may be admitted without question.

EYE SHADE.—The most popular types of eye-shade are made from celluloid or from light cardboard. They can be had in various shapes and in dark green or flesh colour. Some are made in cap shapes which fit the head, while others can be tied on with tapes. If the eye is discharging, it is not advisable to wear an eye-shade without a dressing of some absorbent material. Small shades to cover one eye can be fitted to a spectacle frame, but it must be so arranged that it covers the eye completely. Eye-shades are now being worn a great deal for outdoor sports. In tennis especially, they are very useful as a protection from the glare of the sun which often prevents a player from seeing the movement of the ball.

EYE STRAIN.—By eye strain is meant simply that the eyes are suffering from exceptional tiredness. This may be because they have had to do an exceptional amount of work without rest, or that there is something wrong with the eyes themselves. They may be shortsighted or longsighted or suffering from some disease which will make their muscles less strong than they should be. Anything wrong with the eyes will cause eyestrain if the eyes are used very much.

Symptoms.—The commonest symptom of eye strain is a tired, burning or pricking feeling in the eyes after they have been used for near work such as reading. A habit of frowning, puckering up the eyes, blinking or rubbing the eyes should lead one to suspect that the eyes are being strained. Red eyelids are often a symptom of eye strain, and headache over the eyes, on top of the head, and sometimes at the back of the head on both sides is a very usual result of eye troubles.

Treatment.—When it is obvious that the eyes are being strained and it is necessary to go on with close eye-work, the cause of the strain must be sought out and cured. It is not always necessary to rush to glasses for a cure, as very often the weakness of the eyes is only part of a general state of health below par, and the eyes will strengthen as the general health improves. For a general account of the eye and its diseases *see* under their own headings.

Some simple rules are usually observed in offices and places where people have to do close eye-work. For instance, lights must be shaded so that the bare electric or gas lights do not catch and attract the eye. This is the reason why lamp-shades should be used over bulbs even in a house. The full light from a lamp should not fall on a polished surface on which writing materials or books, etc., are to be used or the "glare" will make seeing difficult. The light should, of course, fall on the book or sewing, and not on the person reading or sewing. To secure this, place the light behind one when reading. A lot of eye trouble is caused by lights which are too dim as well as by those that are too dazzling. If oil lamps are used, be careful to place them at such a distance that the heat from the lamp does not strike on the eyes, as it is very much inclined to. It may seem contradictory to say that one of the worst occupations for the eyesight is that of the stage, but this is so on account of the glare from the footlights which are arranged to light up the upper parts of the actors.

EYE TOOTH.—The eye tooth, or canine as it is often called, is the third from the middle line of the upper teeth. It has a particularly long root which is directed towards the eye, and it often happens that an abscess at the point of this root will cause the eye to appear swollen and bruised or discoloured not unlike a "black eye." (*See also* TEETH.)

FACE.—The face is the front part of the head extending from the rim of the scalp to the neck. There is no part of the body which is so varied in different people. It is doubtful, indeed, whether there are two faces exactly similar in all the world, although marked likenesses or "doubles" are fairly common. The prominent bony parts of the face such as the ridge which is covered by the eyebrows, the nose, cheek-bones and chin are the means by which the character of the face varies. The square face and slanting eyes of the Eastern nations are one distinct type, whilst the high cheek-bones of the Scots are another type. The shape of the face is decided by Nature, but the expression or general appearance of the face can be, and is, altered by the character and circumstances of life of its owner, and in this connection health is important. Faces which are continually suffering from muscular spasms, in which the brows are so often set in lines of pain that the lines become permanent, or which are covered with unhealthy skin cannot be as attractive as those which belong to normal healthy and happy persons.

Skin of the Face.—The skin of the face is thin and delicate compared with skin on other parts of the body, but as it has to stand constant exposure to the weather and to dust and dirt, it is well supplied with sweat and fat glands. These should always be kept in good working order, because when they become blocked up with sweat and oil that should have been washed away but has been forced to collect in the pores on account of being overlaid with frequent doses of powder or left too long uncleaned, they develop acne and other disfiguring conditions. As a rule wounds and cuts on the face heal up very quickly owing to the fact that the face is well supplied with blood-vessels. On the other hand any serious septic condition such as a carbuncle may have grave results owing to the fact that the veins of the face communicate with the skull. For this reason an insect sting on the face should always be carefully treated, especially if it is on the upper lip or cheek near the nose.

The care of the skin of the face from a beauty point of view is described in the SPECIAL SUPPLEMENT ON BEAUTY CULTURE.

Nerves and Muscles of the Face.—The face is well supplied with nerves and muscles, and the interplay of these muscles causes the changing expressions on the face. The most

important nerve which controls these muscles is the facial nerve, technically known as the 7th cranial nerve, which comes from the back part of the brain, passes through the skull to the ear, and continues on to the face round the edge of the jaw. Injuries or wounds on this part of the face may have very serious results, as damage to the facial nerve may leave one side of the face absolutely expressionless such as happens in facial paralysis or Bell's palsy.

Malformations of the Face.—The most common malformation of the face is hare-lip, a condition in which the two edges of the groove of the upper lip do not join together. This condition is congenital (present at birth), and is often accompanied by cleft palate, which is another common deformity.

Lupus, which is tuberculosis of the skin, is more frequent on the face than any other part of the body, and may lead to very disfiguring and unsightly scars. Small tumours may also cause a great deal of discomfort, and many people are afflicted with birth marks such as moles or port wine stains. (*See also* BIRTH MARKS; CARE OF THE FACE in SUPPLEMENT ON BEAUTY CULTURE; CLEFT PALATE; HARE LIP; LUPUS.)

Face Cream.—Face cream is extensively used to protect the skin and to give it a smooth appearance. Cold creams may be used to cleanse the skin, and as a rule they are applied at bed-time after the face has been thoroughly washed and dried. Non-greasy or vanishing face creams are used during the day as a foundation for powder. There are many makes of face creams to be had, but it is advisable for each individual to find out the make of face cream suitable for her own particular type of skin. The question of the care of the complexion from a medical point of view, is dealt with in the SUPPLEMENT ON BEAUTY CULTURE.

FACIAL NERVE.—The facial nerve is the 7th cranial nerve and it controls the muscles of the face, scalp and the ear; curiously enough, one small strand of the facial nerve is the nerve of taste for the front half of the tongue. The facial nerve goes through a canal in the *temporal bone* close to the cavity of the middle ear and then spreads through the parotid salivary gland into a network that is distributed to the muscles of the face. It may be damaged in inflammatory conditions of the ear or in operations (especially the radical mastoid operation on the ear). A severe chill affecting the side of the face may also cause paralysis of the facial nerve (Bell's palsy), which however, is only temporary. (*See also* FACIAL PARALYSIS.)

FACIAL PARALYSIS.—Facial paralysis or Bell's palsy occurs most frequently in adults, though cases in children are not unknown, especially after diphtheria. In adults the commonest cause is neuritis or some inflammatory state of the facial nerve where it enters the skull just behind the ear. Other cases are due to disease in the middle ear, or the radical mastoid operation. It may also be due to direct injury of the nerve or to brain diseases such as meningitis, concussion or fractures of the skull. Facial paralysis due to inflammation or neuritis usually comes on fairly quickly and can be readily recognized after a few days.

Symptoms.—Perhaps the person has been sitting in a draught and begins to feel pain behind the ear. Next day, or the day after, he may find that one side of his face is stiff and wont move properly. There may also be a rash on the face. The condition is nearly always one sided. On eating, the food may gather in between the tongue and the cheek because the muscles are not able to clear it away as one normally does without thinking of it in eating. The inside of the cheek may also be bitten because it falls flabbily within range of the teeth. The condition is tested by making the person laugh, wrinkle the forehead, whistle and close the eyes. The laugh will move the muscles of one side of the face only, the patient cannot whistle, the wrinkling of the forehead will be one-sided only; the eye on the affected side will not close properly, and the eyeball rolls upwards when an attempt is made to close the eye. The senses of taste and hearing may be affected.

Treatment.—Temporary facial paralysis usually clears up in about a month to four months' time. If it goes on longer it may become incurable, in which case an operation may make the condition more comfortable. In the early days of the condition the patient should be kept in a warm room, not necessarily in bed, and heat should be applied over the region behind the ear

which is painful. Blistering, at one time, used to be applied behind the ear, but is not much used nowadays. Antiphlogistine or hot fomentations act as well and are safer and easier to use. Massage and electricity in the form of mild galvanism are useful after the inflammation has subsided.

FACIAL SPASM.—Spasms and twitchings of the muscles of the face are of two sorts. The first sort are real muscular spasms due to some irritation or injury of the facial nerve, while the second part are nervous in origin and are called *tics*, under which heading they are described. (*See also* FIDGETS; ST. VITUS'S DANCE.)

FACTORIES, MEDICAL INSPECTION IN.—Definite provisions are made by law for the medical examination of factory workers, the "certifying surgeon" being a local doctor appointed by the Chief Inspector of Factories.

Women within 4 weeks after childbirth, and children under 12 are prohibited from factory employment. A "child" (under 14, or 13 with a school proficiency certificate) must not be employed for more than 7 or in some cases 13 working days, without a medical certificate of fitness. He must be personally examined at the factory by the surgeon, who must be satisfied that the child has reached the required age. A second medical examination is necessary when the child becomes a "young person" (14 to 18 years). The medical certificate may be qualified by conditions as to work on which the candidate may be employed; if required, the doctor must give his reasons for refusing a certificate in writing. He is allowed to view the process of manufacture before granting a certificate.

FÆCES.—Fæces is the term applied to the discharges from the bowel, which consist of the part of the food which is undigested and other substances such as colouring matter (pigment) from the bile, and large quantities of bacteria. (*See also* STOOLS.)

FAINTING.—Fainting is a temporary loss of consciousness which is also called swooning or syncope. It is due to the supply of blood to the brain becoming insufficient, thus causing a feeble action of the heart. The patient may have a weakened heart which, when any undue strain is put upon it, may cause faintness to come on. Strong emotion such as a great sorrow or joy is a common cause, or extreme shocks to the nervous system such as great pain caused by an accident. The complete muscular relaxation which takes place in a hot bath is sometimes the cause of fainting and people who are in a weak state of health should avoid taking long, hot baths. There are certain drugs which have an effect on the action of the heart and it is not unusual for an excess of tobacco smoking to cause a feeling of faintness. Convalescents who have been in bed for a long period may experience a slight fainting feeling when they start to walk about. Anyone who has become very weakened through illness should avoid any strain whatever, and take life very easily until full strength returns.

Symptoms.—As a rule there is a warning feeling of sinking, and the vision becomes blurred until finally everything becomes black and complete unconsciousness takes place. Anyone about to faint usually turns very pale and staggers a little or leans against something for support before falling to the ground. A person in a faint lies very limp and still, the skin is cold and clammy, and the breathing is very faint. As a rule a fainting fit only lasts a few moments and the patient is seen to make slight movements of the hands and lips. The pulse recovers, and a little colour is seen returning to the cheeks, and in a little while the faint may be over and the patient able to sit up.

There are fainting fits which may last longer than the time stated above, while others again may only reach the first stage of giddiness. Anæmic people always faint more easily than others, and those given to hysteria are very subject to fainting attacks.

Treatment.—The patient should be carried out into the open air if possible and laid flat on the back. Any tight clothing round the neck should be removed and also any tight articles of clothing such as a belt round the waist, or corsets. The face should be bathed in cold water and smelling-salts may be applied to the nose. The blood supply to the brain may be increased by raising the patient's legs. A few teaspoonsful of brandy or other spirits may be given if the patient is able to swallow. It is not advisable to force liquid down the throat of a person in a faint unless they are able to swallow naturally, as choking may take

place. If it is not possible to carry the patient out into the open air, every care must be taken to ensure fresh air coming into the room by opening all the windows and doors. If spirits are not to hand, a teaspoonful of eau-de-Cologne or sal-volatile will serve the same purpose. Should the faint last long, or should the person be subject to frequent fainting turns, it is advisable to consult a doctor to see whether the cause of them cannot be cured.

FALLING SICKNESS.—Falling sickness is an old name for epilepsy, because people with this disease were noticed to fall to the ground frequently after giving a loud cry. (*See also* EPILEPSY.)

FALLOPIAN TUBES.—These are two hollow tubes situated one on each side of the upper part of the womb, the purpose of which is to bring the tiny ovum (which is microscopic in size) from the ovary down into the womb. Inflammation of the Fallopian tubes is called Salpingitis, and is apt to be a serious condition which usually requires operation. (*See also* SALPINGITIS.)

FALSE PAINS.—A few days before childbirth takes place, there may be colicky pains in the abdomen which are not true labour pains. These pains are due to contraction of the intestines and are very liable to occur if constipation is present. True labour pains are accompanied by other signs and are more regular in their occurrence. (*See also* LABOUR.)

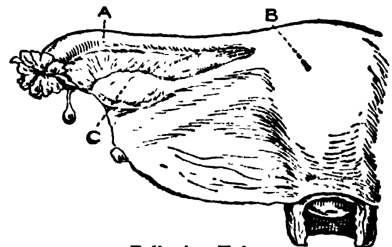
FARADISM.—The electricity produced from an induction coil is called faradism, or faradization when the current is applied to the body. This method of treatment is used to produce the contraction of muscles and stimulation of the nerves, and it is very beneficial in cases of paralysis. (*See also* ELECTRICITY IN MEDICINE.)

FARCY.—Farcy is another name for glanders, and the term is derived from the expression "farcy buds" or nodules which appear in the tissues underneath the skin. (*See also* GLANDERS.)

FARINACEOUS FOODS.—Dishes made from cereals are called farinaceous or *carbohydrate* foods. The chief cereals are wheat, barley, oats, rye, maize and rice, and foods such as sago, arrowroot, tapioca and potatoes are also included. These foods contain a large percentage of starch and the diet should not be made up entirely of carbohydrates, but should be supplemented with other foods such as eggs, milk and butter, etc. (*See also* SUPPLEMENT ON DIET.)

FASCIA.—Fascia is the name applied to sheets or bands of tissue which surround and connect up the muscles of the body.

FASTING.—Fasting or going without food of one's own free will has been much in the news of late years since people began to desire to be rid of their overweight of flesh, and to realize that as much harm is done by too much and too good food as was ever done by under-feeding. In the olden days, however, fasting was ordained as a religious exercise and by some religions was carried to such extremes that the practice fell into disrepute amongst most people and is now only carried on in a very modified form as a



Fallopian Tube:
A Fallopian Tube; B Uterus or Womb; C Ovary

routine religious exercise, such as the Friday limited fasting of the Roman Catholic Church and the Lenten abstinence which many people undertake. Fasting in public for long periods has become a "stunt" for the purpose of raising money, as there seem to be a considerable number of people who will pay to see another person starving, or will make bets on how long the fasting person can go on. Other persons use starvation to obtain release from prison at least into the prison infirmary. A prominent Indian nationalist leader, has several times undertaken fasts of varying duration for political reasons. These are just a few aspects of the subject, but the most important aspect is the medical one.

Medical Fasting.—All people who work amongst animals and babies, which are both classes of creatures largely guided by instinct, know that an animal or baby will from time to time indulge in a short fast of a few hours, a day or couple of days without any obvious reason. Then the feeding process will be taken up again. This is a

provision of nature to cure some temporary ailment of the digestive system. When the baby grows into a child other factors come into play. The child has learnt to enjoy its food and no longer responds instinctively to the call of the stomach for a rest. By the time adult age is reached fasting is no longer an instinct and has to be undertaken deliberately as a commonsense measure or by the doctor's orders.

Fasting Methods.—Complete fasting is hardly ever desirable for more than a few hours. In a case such as rupture of the stomach nothing whatever must be given by the mouth until the operation has been done to repair the damage. A day's fast once a week during which nothing is taken except orange juice and water is very beneficial to some people, especially those suffering from chronic intestinal poisoning, a condition in which there are too many harmful germs breeding in the intestine. Other fasts that are undertaken medically are fasting diets for the rapid reduction of weight. These fasts should only be attempted in bed under a doctor's care, and are usually combined with medicinal treatment as well. Further discussion of them will be found in the article on Obesity. (*See also* SUPPLEMENT ON DIET.)

FAT.—Fat which is easily recognized as a greasy substance, is made up of glycerine and various fatty acids, some of which are liquid and others are solid. Fats vary in consistency; some being soft and flabby, and others like mutton fat being firm and solid. They all melt easily when heat is applied. Alkalies will split them up, and certain of the digestive juices called ferments in the body will change them back into the different substances of which they were composed originally. The chief ferment for digesting fat comes from the gland called the pancreas and requires to be mixed with bile from the liver as well before it does its work properly.

Fat is necessary to the body in order to produce heat and energy. Its value in this respect is fully described in the supplement on diet. Too much fat may be stored up in the tissues of the body instead of being utilized by the body as fuel, and this condition is known as Obesity. Obesity can be dangerous to life as well as a source of discomfort to the individual. Methods of treating this over-fatness will be found under the heading of Obesity. Fat as a cooking agent is used very extensively in everyday diet. The chief animal fats used in cookery are butter, lard, suet and dripping from beef or mutton. Cod-liver oil and cream are also animal fats. Of vegetable fats the chief are olive oil and margarine. Nut-oils are also used either in the form of oil or in butter form. These frying or cooking fats should be taken into consideration when the diet is being considered because they add considerably to the amount of fat taken daily with the other food, and it is a favourite error to say that no fat is being taken when much of the food is being fried. (*See also* DIGESTION; SUPPLEMENT ON DIET AND INVALID COOKERY.)

FATIGUE.—Stories reach us now and again of couples who dance for an incredible number of hours. What their condition is, of mind and body, at the end of these so-called feats of endurance, we are usually left to imagine for ourselves, although we do occasionally hear of their being reduced to a state of collapse. This is small wonder, for our bodies are so made that periodic rest is as important as action.

It is not possible to work as quickly and as well when you are tired as when you are fresh, for being tired means that the human machine is running down and needs winding up. The best way to wind it up is by rest. Sleep is as necessary as food.

Fatigue in Industry.—The following are some observations made by medical and other workers in relation to fatigue in industry. Interest in this question began during the great war, and has continued to this day, under an Industrial Health Research Board with offices in London:

You cannot do your best work unless you are in your best health.

Your "best" is when you rise steadily to the top of your form, not when you start off with a spurt and then slacken speed. This is the same with games and with races.

The atmosphere in which you do your work matters. But what matters even more is that the air should be kept moving—as when an electric fan is working—because the currents of air stimulate the skin and so save energy, especially when the work is of a heavy manual kind, by preventing too much perspiration which causes weakness.

Rest pauses are very important.

So is suitable food.

So is suitable clothing.

Monotony—in everything—is bad. Change in occupation, in temperature, in ventilation, in food, is important and, of course, change of posture if the work is sedentary.

Your eyes will be less tired if you look away from your work occasionally, thus giving them a change of focus.

You do better work with shorter hours, especially if there are no rest pauses. And your health is better too.

The lighting is very important. Daylight is better than artificial light, if it can be had. Windows should be clean and let in all the light there is.

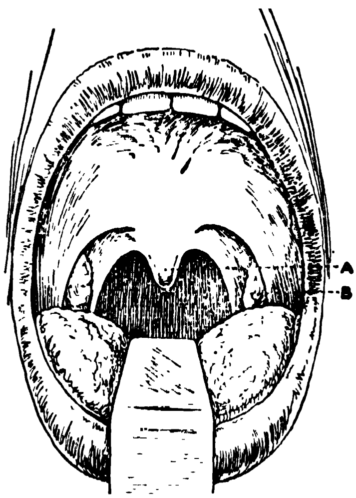
A clean skin reacts better to ventilation than a dirty one, and you are less likely to get blood-poisoning if you have a cut or scratch and something poisonous gets into it.

It is to the interests of both employer and employed to get the best output of work with the least fatigue.

That this is recognized by many employers is plain. A large number of big commercial and manufacturing businesses have their welfare departments, with rest-rooms, a nurse to look after the sick and give first aid, a canteen, perhaps the morning cup of tea or cocoa, clubs, organized games and sports grounds, etc. The object of all this is the maintaining of a high standard of health among the workers, keeping them happy, well and contented, so that their output of work may be at its highest level. It is an excellent sign of the times that employers realize that their human machines are at least as important as their plant, if not more so, and they find by experience that money spent in giving these facilities to their staff brings its own reward in better health, and therefore better and speedier work. The investigations already made have shown that it is wasteful to keep exhausted men and women and young people at work.

Fatigue is as important in the home as in the factory or office. The movements a woman makes in putting things into the oven and taking them out, in cleaning a room and so on, may be wasteful of energy, and experiments have been made, in what is called "motion study," to find out the least number of movements needed for each bit of work. "A woman's work is never done," therefore it is to her own interest to think out, apart altogether from labour-saving appliances, whether there are not ways in which she can save herself fatigue in her daily job.

FAUCES.—Fauces is the name given to the narrow opening between the mouth and the throat. On either side are the pillars of the fauces in which the *tonsils* are imbedded. Above the opening is what is known as the *soft palate*, and below lies the root of the tongue. During an attack of tonsillitis, the narrow opening, or fauces, is very often



Fauces :
A Uvula ; B Tonsil

blocked up by the inflammation of the surrounding tissues and tonsils. (*See also* TONSIL; TONSILLITIS.)

FAVUS.—Favus, like ringworm, is a disease of the skin and hair caused by the growth of a fungus; and again like ringworm, it is most common upon the scalp, though it may be found on the non-hairy skin, and affecting the nails. Its special feature is the production on the surface of rounded, sulphur-yellow, cup-shaped crusts, called *scutula*, which crumble readily. In some cases these are absent, and the disease then closely resembles ringworm, but can be distinguished from it by microscopical examination of the hairs. When a scutulum is removed, a moist, inflamed depression in the scalp is seen.

If it is left to itself, favus causes baldness by pressure on the hair roots. It goes on

growing till the whole scalp is affected, and may finally "cure itself" by killing off all the hair.

The cat and the mouse are both affected by favus, and are in many cases responsible for its occurrence among human beings (compare also ringworm). Favus is passed on from one person to another, but it is remarkable that quite often only one in a family will be attacked. Ringworm, on the contrary, unless great care be taken, runs through a family or a whole school very rapidly.

The outlook in favus depends on the treatment. "Left to itself the disease goes on for ever"; and even with thorough but conservative treatment a bad case may last for very many years. One case is on record in which a woman had gone on for over fifty years, and this patient was responsible for infecting all her children.

Treatment.—If favus attacks the non-hairy skin only, it is readily cured by the *constant* application of an antiseptic ointment, the time taken for a cure varying from one to eight weeks.

If only a small area of the scalp is affected, it can also readily be cured by pulling out the hairs with forceps, and thoroughly rubbing in an antiseptic ointment. In widespread cases there are only two methods which are of the slightest practical use, namely, X-rays and thallium. (*See* RINGWORM for details.) Conservative methods such as cutting the hair short and rubbing in an antiseptic ointment are so useless that even the risk of permanent baldness from X-rays or thallium is justified in the hope of a cure. It has been said that "children affected with favus get no education, and when they grow up no employment; the boys drift into the criminal classes and the girls to the streets." Thanks, however, to the energetic co-operation of educational and medical authorities, the disease is gradually being stamped out in this country.

FEBRIFUGE.—A febrifuge is a drug which is given to reduce fever. Some drugs lower the temperature by increasing perspiration, while others act by preventing the body from manufacturing more heat. Quinine, salicylic acid and antipyrin are a few of the better known antipyretics, which is another name for drugs which lower the temperature of the body. (*See* ANTIPYRETIC.)

FEEBLE-MINDED means something quite definite in medicine, as well as in law, and because the meaning is so well expressed in the Act of Parliament passed in 1913, it will be here quoted: "The feeble-minded are persons in whose case there exists from birth or from an early age mental defectiveness so pronounced that they require care, supervision and control for their own protection or for the protection of others." This statement puts in a nutshell the whole history of those unfortunates whose brains have not fully developed, or who have, as a result of some illness of the brain in early childhood, lost the power to think like normal people.

The feeble-minded are unfortunate, first, in that their brains are not normal, and secondly, that only too often the real existence of an undeveloped brain is not recognized, and they are branded as lazy, unwilling individuals. This is especially the case when, as so frequently happens, no bodily disease or deformity is present such as occurs in persons in whom the brain is yet more undeveloped. But the trained eye can pick out the feeble-minded at a very early age. Quite often the doctor is consulted because an infant is "backward" and has not sat up, walked, or talked at the proper times. Although this backwardness in development may be due to bodily ill-health or to improper feeding, in the absence of any such obvious cause it is probable that the backwardness is due to poor development of the mind. If there is a family history of any nervous or mental trouble, very marked "backwardness" in a child—especially in talking, walking and learning clean habits—must be regarded with very grave suspicion. During infancy and early childhood this "backwardness" is noticed more and more in the case of the feeble-minded.

Such children do badly at school, though not every child who is an apparent dullard at school is feeble-minded; there are thousands of children who, for one reason or another, varying from enlarged tonsils to a too vivid imagination, do badly at school but become excellent citizens and even Cabinet Ministers. But it is generally possible by the time a child reaches the second year of the school age to find out whether he is incapable of learning his lessons because of a lack of development of his brain, or because there is something at fault which can

be put right. With the wonderful system of school supervision there is in England at the present day, this task is undertaken in all elementary schools, and those children who are not, and never would be, capable of benefiting by ordinary school-teaching are sent to special schools at which the most is made of what intelligence they possess, and where they are trained for such occupations as it will be possible for them to manage after leaving school. The type of work the feeble-minded are able to do is only routine work, which does not call for any responsibility; and unfortunately, in many cases, the feeble-minded are so impulsive and difficult to get on with that they cannot keep any situation that may be found for them because they do not get on with their fellow-workers. They lack that power of control, and also the common sense which most normal individuals possess, and so find it impossible to live truly independent lives; they require, all through their lives, constant oversight and supervision. One example of this may be given: a feeble-minded person may be earning quite enough to pay for his keep by some mechanical job, such as a labourer's, but he will be incapable of laying out the money so earned in a proper manner, and will squander the whole week's income on some absurd fancy if not prevented.

As a rule the feeble-minded are easily managed, but a few are obstinate to a degree which taxes the patience of those who are dealing with them. In a few cases they show moral defects which may bring them within the reach of the law; petty thieving, especially of articles which have an appeal to the senses rather than for their money value, is perhaps the commonest offence. They steal because "it looked pretty" or "it glittered," not because the article would be saleable. Sexual offences are not infrequent, particularly against children. It is in these cases which show moral defects that the question of diagnosis of feeble-mindedness arises, for the same distressing anti-social conduct may be seen in the late stages of encephalitis lethargica ("sleepy sickness,") and in some other states of mental disorder. It is of the greatest importance from the standpoint of the law to distinguish between these forms of mental trouble, for there is a special Act which deals with the feeble-minded and provides for their safety as well as for the safety of those with whom they come into contact.

Treatment.—Although feeble-mindedness is incurable in one sense, being a lack of development of an essential part of the mental equipment, yet much can be done to help these unfortunate people to make the best of what Nature has given them in the way of a brain. It has been indicated already that much is done in the schools to "sort out" the feeble-minded from their normal fellows, and the institution of special schools is a step forward in the right direction. When adult life is reached the problem is more difficult.

The feeble-minded are generally healthy physically, the bodily health being as a rule proportional to the degree of feeble-mindedness, and as most of the feeble-minded are only slightly below the normal standard of mentality, their expectation of life is good, many living to fifty or sixty. The object of all treatment should be to make the best of what they can do and, for this purpose, simple, non-technical occupations are the most satisfactory. The out-door occupations, such as farming or gardening, which can readily be supervised and in which physical exertion is required are perhaps the most suitable. For women, domestic work in large establishments where, again, ample supervision is available, or the simpler types of handicraft are advisable. Even in adult life much may be done by skilful management of such cases and by wise training, but the earlier the training is commenced, the better will be the final condition of the feeble-minded individual. In childhood an intelligent mother may raise the standard of intelligence of a feeble-minded child to one little removed from the normal, and later on in adult life his difficulty in adapting himself to the normal world may be reduced to a minimum by kindly and sympathetic understanding of his difficulties. But only too often the feeble-minded are found to be "more bother than they are worth" and they wander through life bewildered and useless. (*See also* ENCEPHALITIS LETHARGICA.)

FEEDING.—*See* SUPPLEMENTS ON BABY, and DIET AND INVALID COOKERY.

FEEDING-BOTTLE.—The best type of feeding-bottle is the boat-shaped variety

which is covered at one end by a rubber teat and at the other end by a rubber valve. This type is easily kept clean especially if the openings are large enough to allow the passage of a bottle-brush. Care should be taken to see that the rubber teat and valve fit on firmly at either end, otherwise the baby may drag them off while being fed.

The proper care of the feeding-bottle is a very important matter as a dirty feeding-bottle may lead to infection and disease. This matter will be dealt with more fully under the heading INFANT FEEDING in the SUPPLEMENT ON BABY.

FEEDING-CUP.—Patients who are unable to sit up in bed should be provided with a suitable feeding-cup which enables them to drink any liquid food without spilling it over themselves or the bedclothes. A feeding-cup has a spout for the patient to drink from, and the top opening of the cup is half covered over so that when the cup is tilted forward the contents are prevented from spilling.

FEMORAL VESSELS.—The main blood-vessels of the thigh are the femoral artery and the femoral vein.

The *femoral artery*, which is a continuation of the abdominal aorta, leaves the abdomen in the middle of the groin and travels down the upper leg to the back of the knee where it becomes the popliteal artery. After the femoral artery leaves the pelvis it can be felt as it passes into the groin and pressure can be applied at this point to stop bleeding. In the groin the artery is not situated very deeply, and so is liable to receive serious damage if anything pierces the groin.

The *femoral vein*.—The corresponding vein to the femoral artery in the leg is called the femoral vein. The two blood-vessels run closely together for the whole of their course down the leg to the back of the knee. The femoral vein, or one of its tributary veins, are often the site of a *thrombosis* or clot of blood which may follow on from the condition called *phlebitis* in which there is an inflammation of the walls of the vein and the surrounding tissues. *Varicose veins*, which are veins in which the walls are abnormally dilated or stretched, are commonest in the leg too, and many of these veins go to join the femoral vein. The condition called *white leg* which sometimes arises after childbirth is also associated with the femoral veins. These conditions will be described under their own headings.

FEMUR.—The femur or large bone of the leg is the longest and strongest bone in the body. It stretches from the hip-bone to the knee joint. The femur, like other long bones of the body has a body and two ends. The upper end of the femur has a large rounded head, which fits into the cup of the hip-bone, a narrower neck and two jutting out pieces called *trochanters*.



Femur

The lower end of the femur forms part of the knee joint. It consists of two longish jutting-out pieces called *condyles*.

Fractures of the Femur.-The femur, as has been said, is a long and strong bone. It therefore requires a considerable amount of violence to break it in any but the aged people. In old people, however, it is liable to snap near the upper end, owing to the brittleness of the bones in old age, and a fractured femur is always a very serious matter in an old person, and is frequently fatal owing to the complications such as pneumonia that may arise from the necessity of keeping the body flat in bed. This has a very bad effect on an already enfeebled circulation.

Treatment.—In younger persons the same danger of pneumonia exists but more effective measures can be taken to prevent it. For instance, it is not necessary to keep them in bed for the same length of time, and some surgeons get them up and about on crutches with the leg in the special splint, called Thomas's splint, in a very short time. Great care must be taken with the setting of a fractured femur as it is very liable to shorten the leg and thus throw the whole body out of alignment. Unfortunately, the surgeon has

often no choice between risking his patient's life by keeping him lying in an immovable position and letting him get up at the risk of shortening his leg.

FERMENTATION.—Fermentation is produced by the presence of minute germs and yeast plants. Probably the best-known example of fermentation is the production of alcohol. A slight degree of fermentation is always present in the stomach, but this is only dangerous when it takes place in excess. The formation of gas in the stomach is a sign that too much fermentation is taking place owing to the presence of undigested foods, which should be removed by taking a suitable purge and regulating the diet. (*See also* ALCOHOL; DIGESTION; INDIGESTION.)

FERMENTS.—Ferments are substances which when in contact with another substance are capable of bringing about chemical changes, and these changes play an important part in the digestion of our food. There are various types of ferments, but each one has its own particular task of turning our food into a suitable form for easy digestion. For example, a ferment which decomposes fat is found in the stomach and in the pancreatic juice, while a ferment which curdles milk is found in the stomach and the intestinal juice. *Ptyalin* is the name given to a ferment which is found in the saliva, but similar ferments are found in the bile, blood and urine, etc. (*See also* DIGESTION.)

FERN ROOT.—A preparation made from the root of the common male fern is used as a cure for tapeworms. Before taking this drug, a dose of castor oil should be given, and very little food should be eaten during the day in order to starve the worm. A teaspoonful of male fern, as this drug is called, is then taken at night and followed by another dose of castor oil in the morning. As a rule, this cure will be found sufficient to get rid of the worm. (*See also* TAPEWORM.)

FERRIC SALTS.—Ferric salts are preparations of iron which are chiefly used in medicine in cases of anæmia. Parrish's food, Easton's syrup and Blaud's pills are iron preparations which are very popular; they are very good for strengthening the blood and increasing the general tone of the body.

FESTER.—Fester is a popular term used in connection with the formation of pus or matter. (*See also* ABSCESS; ULCER; WHITLOW.)

FEVER.—Fever is a condition in which the body-temperature is raised above normal. Fevers in general are discussed under the heading Infectious Diseases. In tropical countries to be "down with fever" usually means to have malarial fever. In this country, however, the disease which is spoken of as "fever" is scarlet fever.

FIBROIDS.—Fibroid tumours of the womb or fibroids as they are often called, are much the commonest tumours in women. They are on the whole more common in young unmarried women and women who have not borne children than in mothers of families, and, indeed, they are one of the commonest causes of barrenness in a married woman. Often these tumours are small and cause no symptoms, so that their presence is not suspected, but on the other hand they may grow to enormous sizes. They have been found weighing anything up to 100 pounds.

Symptoms.—As has been mentioned above, fibroids often cause no symptoms, or at least no symptoms that are sufficiently uncomfortable to attract notice. When there are symptoms the commonest ones are excessive loss at the menstrual periods, and swelling and increase in size of the abdomen. There may also be pain and discharge from the front passage. Sometimes the tumour is only discovered because the patient is being examined to discover the cause of obstruction to the working of the bowels or bladder, or to both, and in the course of the examination the large tumour in the womb is found.

Treatment.—Small fibroids which are not causing discomfort or excessive bleeding require no treatment. If treatment is required the tumour can be removed by peeling it out of the womb, an operation which is simple and safe, and does not disturb the functions of the reproductive organs. If the growths are very large, very numerous, or show signs of turning malignant as they sometimes do at the change of life, the whole womb is often removed; but this is a matter for the advice of a specialist.

FIBROSIS.—By fibrosis is meant the development of a tough and leathery sort of tissue called fibrous tissue. Fibrous tissue most often develops where there has been some injury to the ordinary tissue of a

structure to such an extent that it cannot hope to recover. Fibrous tissue, though it is Nature's way of repairing an injury, cannot take the place of living tissue in the functioning of an organ or of a muscle, so that when the process of fibrosis is seen to be going on the cause of it must be searched for and found. If possible it must be arrested and cured. Sepsis, poisoning by germs or toxins, errors of diet, etc., may be the cause of the *fibrotic* process. A common form of fibrosis is that which develops in a muscle which is kept still after an injury. Massage and exercises performed with the limb by another person should be used to stop the fibrosis from forming. (*See also* MASSAGE; REMEDIAL EXERCISES.)

FIBROSITIS.—Fibrositis or myalgia is a condition in which inflammation occurs in the muscular tissues of the body. Tiny swellings, or nodules as they are called, appear in the tendon coverings of the nerves, ligaments and similar structures which form part of the muscular tissue of the body. These swellings are very painful to the touch and they cause intense pain on movement of any of the muscles. There is often a certain amount of stiffness as well. The name "muscular rheumatism" is often used for fibrositis, and it is generally considered to be due to the same causes which produce other forms of rheumatism.

When fibrositis occurs in the back the condition is known as lumbago, and this form can be very crippling indeed. Another common type of this condition occurs in the neck (stiff neck), or the chest may be attacked (pleurodynia). There is also a very common condition of aching and stiffness of the muscles over most of the body. The pain may come on suddenly and, as a rule, there are intervals of pain until the condition is cured.

Fibrositis appears to occur more often in men than in women, and it is commoner after middle life. The condition is probably due to the presence of some infection in the body. Usually bad teeth or infected tonsils are the cause, or there may be some poisons present in the intestines owing to faulty diet. Attacks may also follow exposure to cold or wet, or prolonged fatigue or strain.

Treatment.—If the pain is very severe the patient should rest in bed, but as a rule the milder attacks are not severe enough to compel complete rest. Heat applied to the body is the most soothing way of easing the pain, and this may be given in the form of a hot bath, hot fomentations, or hot-water bottles. Radiant heat baths or hot air baths are very good if they can be taken.

Massage should be carried out, as it tends to increase the circulation of the blood over the affected part. The swellings or nodules should be looked for, and if these can be gently rubbed away, so much the better. Liniments may be rubbed into the skin to stimulate it, and a very useful one consists of methyl salicylate, menthol, oil of eucalyptus, and oil of camphor. An ointment made of methyl salicylate and lanolin is also very good. A combination of massage and heat can be given by going over the affected part with a warm iron. The skin should be protected by layers of brown paper, and only the very lightest pressure should be used.

Drugs such as sodium salicylate or aspirin may be given to help to relieve the pain. If the attack is severe, 15 to 20 grains of sodium salicylate may be given every three hours for the first twelve or twenty-four hours, then the dose should be gradually lessened.

The treatment so far has only dealt with relieving the pain, but this can in no way bring about a real cure. The cause of the fibrositis must be discovered, and this can only be done by a complete overhaul of the body, especially the teeth and tonsils. (*See also* RHEUMATISM.)

FIBULA.—The fibula is the smaller bone in the lower leg. It lies on the outside of the leg and meets the larger bone of the lower leg, the tibia, at both ends. The tibia and fibula curve away from each other, however, in their course between their two ends. The upper end of the fibula is not part of the knee joint but begins just below it and can be easily felt as a lump sticking out from the bent knee on the outside of the front of the leg. At the ankle, however, it joins up with the ankle bone and the tibia to form the ankle joint. (*See also* ANKLE; LEG.)

Fractures of the Fibula.—The fibula is altogether a slighter bone than its fellow, the tibia, and is liable to be broken. But the strong tibia usually serves as a splint and saves the damaged fibula from serious

displacement. By reason of the strength of the tibia the broken fibula need only be bandaged, not splinted during the day, and it reunites very quickly. The weight of the body may often be put on the foot as soon as three weeks after the break. Massage and passive remedial exercises may be carried out almost from the first.

FIDGETS.—Fidgets is a word used to describe the jumpy and restless movements seen in children. It is always a sign that the child is in a highly nervous state, and the condition may be made much worse by allowing the child to become over-tired. As a rule, these nervous children are of the more intelligent type, and a little extra care may be required to deal with the condition. An ordinary scolding in order to make the child sit still will only increase the state of nervousness, and a wiser mother who has her child's interest at heart should give a little thought and study to the situation. Proper clothing, diet, exercise, fresh air and plenty of good sound sleep are all necessary towards the treatment of this condition.

The more regular type of jerky movement may be due to "tic" or twitching of the muscles, which usually begins as a form of nervousness and later develops into a habit. In older people fidgets is generally a sign of over-tiredness. It should not be forgotten that chorea or St. Vitus's dance may be mistaken for ordinary fidgetiness. For a description of this disease of childhood *see* St. Vitus's Dance.

FIELD OF VISION.—When a person is looking straight forwards, he not only sees objects before him, but also to some extent on both sides of, and above and below, the point on which his eyes are fixed. This range of sight is called his *field of vision.* It may be tested by a very simple method. The surgeon faces the patient at a distance of three feet. The patient is told to look at the surgeon's opposite eye (that is, right to left, and *vice versa*) the other eye of both patient and surgeon being closed. The test object may be the surgeon's fingers, or a square of white paper, or, better still, a hatpin with a white head. The surgeon holds this midway between himself and the patient, and gradually moves it in from above, below, etc., towards the centre, the patient giving a sign when he first becomes aware of it. (The surgeon's own field affords a useful check and standard of comparison.) A defect in the field of vision of either eye is thus easily ascertained. If very exact results are desired, an instrument called a *perimeter* is used.

The field of vision is altered in various diseases. In disease of the nerve of the eye it lessens progressively, beginning at the outer limits and working inwards. In *retinitis pigmentosa* the outer portions are cut off, the central vision remaining good; sometimes a *scotoma* or "blind spot" occurs at some point. A central blind spot, which is naturally most disabling, occurs in tobacco blindness, some forms of optic atrophy, and neuritis. Irregular alterations may occur in *glaucoma.* The upper part of the field is lost in *detachment of the retina.* When the nerve fibres in the brain which control the sight are abnormal, each eye may see only its right or left half of the field of vision, the other half being "blind." In some cases the outer fields are cut off. This occurs when portions of the nerve fibres are pressed on, as in the case of a tumour in the brain.

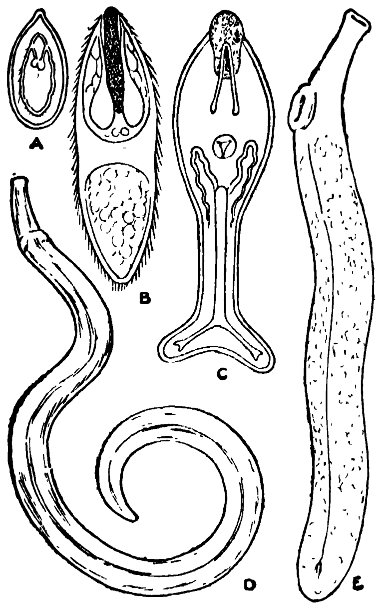
In hysteria and neurasthenia the field of vision is frequently lessened to a remarkable degree. If its limits are re-tested at once, it will be found that the field is still further lessened in all directions. This is due to nerve fatigue, and after rest the field is found to have increased once more.

FIG.—Figs, as well as various preparations made from them, act as a mild type of laxative medicine. Syrup of figs is a well-known and very useful medicine for children, but the effective ingredient in it is really senna.

FILARIA.—Filaria is the name given to a group of tiny worms which are responsible for producing disease in human beings. (*See also* Elephantiasis; Filariasis.)

FILARIASIS.—This is a disease which is common in tropical and sub-tropical countries, and it is caused by infection by tiny worms, especially the type known as *filaria bancrofti* and the *loa loa.* The embryo, or baby worm, is injected into human beings by the bite of the female mosquito, and they pass into the lymphatic vessels and glands (vessels and glands which act as filters for the blood), where they grow and eventually start to breed. The female worm produces large numbers of embryos or baby worms, and these are circulated throughout the

body in the blood. These are taken up by a biting mosquito, and, after undergoing changes in its body, are injected again into other human beings; thus the disease is spread and kept going. The peculiar thing about these tiny worms is that they stay hidden away in the lungs and kidneys all day and only enter into the blood-stream at night when the mosquito is abroad to do its deadly work. But if a person who is on night-duty sleeps during the day, then the



Filaria
A Early Embryo B Embryo, inhabiting temporary host C Larva leaving temporary host in order to enter human host D Adult female E Adult male

worms change their time for entering into the blood-stream, so it seems highly probable that sleep has something to do with the state of the blood, though nothing definite has been proved about this condition so far.

The presence of the embryos may be quite harmless while they are in the blood, but it is when the adult worms cause obstruction in the lymphatic vessels and glands that serious damage takes place. The results produced by this blockage may include *elephantiasis* which has already been described under its own heading. *Lymphangitis* is another condition in which there are painful red lines underneath the skin and the lymphatic glands usually become enlarged. Still another disease caused by this blockage is elephantoid fever which is rather like malaria in character with the addition of inflammation of the lymphatic glands. Chyluria due to filaria is a condition in which the lining of the bladder is ruptured and the urine is milky in appearance and may contain blood.

Treatment.—There does not seem to be any drug which is capable of curing any of the conditions produced by these tiny worms or of killing the adult worms or embryos. Injections of sodium antimony tartrate have been given, but they do not seem to have any lasting effect. In lymphangitis complete rest is indicated, and in chyluria all fat must be omitted from the diet. (*See also* ELEPHANTIASIS.)

FILTERS.—A drop of stagnant pond-water seen through a microscope is an alarming sight, swarming as it does with tiny living and moving things. It is comforting to know that the water that comes through the tap in our houses has been filtered to remove impurities before it reaches our cisterns.

For filtering large quantities of water, sand filter beds are generally used, a layer of fine sand at the top, then a layer of gravel, then gravel and pebbles; through these beds the water passes before being distributed to the public. The filtration beds are periodically cleaned to get rid of the matter which is left on the sand, gravel or pebbles, and the beds are emptied from time to time.

But there are still country districts with no public water supply, where the inhabitants are still dependent, as were generations before them, on pumps, old and perhaps defective wells, or even ponds. They would have a bad shock if they were to see a drop of pond water magnified by a microscope and thrown on a lantern screen. Sometimes the only water available is rain water flowing from roofs into butts or tanks, and although rain water is naturally pure, it collects strange objects in its passage through gutters often choked with dead leaves. For all such water, straining through fine muslin and then boiling is the best treatment.

True, domestic filters are still on sale, although with the increasing care of the public authorities with regard to water supply in rural districts they may one day be seen only in museums. It must be plain to anyone that unless the filter is clean, the

water that passes through it next time cannot be clean either, and the only type of filter for domestic use that can be recommended is one that is easily sterilized by boiling; this should be done every other day. And such filters are expensive. It is much simpler to boil the water.

The Ministry of Health, now the central authority for the public water supply in England and Wales, has called attention to the importance of the rural districts, many of which are still without a satisfactory supply. One of the reasons for this is no doubt the cost of supplying water through pipes. But it is the duty of local authorities to provide their districts with water where there is danger to health owing to insufficient or unwholesome supply, and of rural authorities to see that all occupied dwelling houses in their areas have a proper supply within a reasonable distance. Obviously, the ideal is that every cottage should have pure water, filtered at the source, and local councils have the power of contributing to parochial schemes.

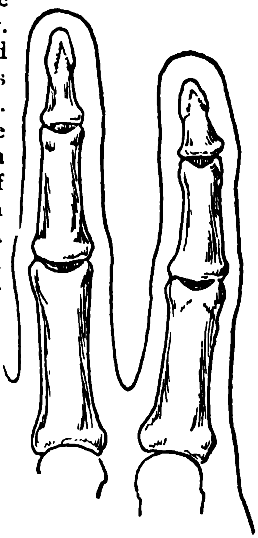
Meanwhile, everyone should realize the importance of pure drinking water. We need only remind ourselves that some of the more serious illnesses are conveyed by drinking bad water to see its urgency. Enteric (typhoid) and cholera are among the waterborne diseases, and either may easily become epidemic.

Certain minute germs are known as "filter passers" because they can grow through the walls of the laboratory filter—another reason for taking the utmost care with regard to the water we drink.

FINGERS.—Perhaps one of the greatest differences between the human being and the lower animals is in the great development of the human hand as compared with the front paw of the animal. This development is seen especially in regard to the fingers, of which it may be said that they are the means by which practically all of us earn our daily bread. For this reason they are of immense importance, and even an apparently simple injury should be treated with great care if there is any danger of its crippling the hand.

Each hand has four fingers and a thumb. These are commonly called by special names for convenience. Next to the thumb is the index finger, then the middle finger, followed by the ring finger and little finger. As a general rule there is a marked similarity between the two sets of fingers on the two hands with regard to shape, but frequently the right hand is larger than the left, and the fingers are correspondingly more sturdy.

Each finger has three bones which are called the phalanges, each separate bone being a phalanx. It will be seen later in the description of hands that the bones in the palm of the hand are called metacarpals, so the first phalanges or bones of the fingers join on to their corresponding metacarpals to form the knuckle joint. The second and third phalanges are also jointed. The joint at the knuckle has a wide range of movement both in the up and down direction and in the sideways direction, whereas the other finger joints can only move up and down.



Fingers: Skeleton of index and second finger of left hand

There are no muscles in the fingers, but the muscles lying in the palm of the hand extend into the fingers in the form of strong tendons. Other strong tendons reach from the forearm to the fingers by way of the back of the hand. Each finger is supplied with a tendon to bend it (flexor tendon) and a tendon to straighten it out (extensor tendon). The fingers have a good nerve and artery supply, and the sense of touch is very well developed, especially in the thumb and index finger, which are the two most important parts of the hand. It will be noticed that when the hand is closed the index finger and the little finger can be easily stretched out, whereas it is difficult to point out the other three fingers without opening the hand. This is because the index and little finger have each an extra extensor tendon.

Delicacy of touch and accuracy of movement are very highly prized in some trades and occupations and can be developed to a very high degree. The fingers of a Lancashire weaver will do things that would be impossible for instance to a farm worker.

Disease of the Fingers.—The fingers are so greatly used and are in such an exposed position that they are very subject to injury and infection. The bones may also become tuberculous in childhood, a condition which is known as dactylitis. Rheumatoid arthritis frequently deforms the fingers of older people. Contracted fingers in which the little and ring fingers bend into the palm of the hand is often a hereditary condition, but may be the result of irritation to, and over-use of, the fingers. "Writer's cramp" is a condition of nerve strain in which the fingers become useless for certain movements until they have had a prolonged rest. Whitlows are painful abscesses occurring in the hand. Raynaud's disease is a disease in which the fingers go "dead" owing to defective circulation. Various skin diseases affect the fingers such as itch, Baker's itch, cheiropomphlyx. All these different conditions affecting the fingers are described under their own headings. Gathered fingers are also described separately, as they are important because of the bad results they may have.

Fingers, Gathered.—A gathered or poisoned finger is a very common occurrence with some people, whilst other people can get all sorts of cuts and scratches on their hands without any bad results. Certain classes of people, too, have to be more careful than others when they get a slight injury on the hand. The most dangerous occupations as far as hand injuries are concerned are doctors, nurses and workers on the land. The first two groups because of the great danger they run of getting virulent germs into the cut, followed by rapid blood-poisoning which may mean the loss of the limb or even of life; and the land workers because of the danger of infection with the germ of lockjaw (tetanus) which lives in the soil. Gathered or festering fingers are usually due to infection entering the skin by some very small and often unnoticed opening such as the minute opening made by a thorn or splinter. A larger cut which bleeds freely is not so liable to gather because the bleeding washes out the wound. The symptoms of a gathered finger are the same as for any other abscess. Redness, soreness and heat concentrating in one spot and finally coming to a head with a collection of pus or matter.

Treatment.—If there is a splinter or piece of dirt in the sore spot or under the nail where the gathering is, it should be removed if it can be seen. The finger should be soaked for long periods at short intervals in water as hot as can be borne with some mild antiseptic in it. Or it may be poulticed with antiphlogistin or hot fomentations and wrapped up until the abscess points, or comes to a head as it is commonly called. A tiny gathering will open and discharge of its own accord with this treatment, but any larger abscess will have to be carefully opened by a doctor. If the gathering is on the front of the finger a scar may be formed by unskilful treatment which may lessen the feeling power of the finger. In some occupations this may not matter, but to some workers it may be a distinct disadvantage. For bandaging the finger *see* BANDAGES.

FINGER-STALL.—A loose covering for the finger, made of rubber or thin leather, is described as a finger-stall. It is worn to prevent irritation or infection to a cut or sore and it is especially useful to the housewife who has to go about her duties of washing-up, etc. The stall for this purpose could be made out of the finger of an old glove. The stall may be worn over a thin dressing.

FINSEN LIGHT.—A form of light from which the heat rays have been excluded and only the blue and violet rays remain is known as Finsen light. It is used a great deal in the treatment of diseases of the skin. Dr. Finsen, a physician, was the first to discover the effect of such light and, while working in Copenhagen, he made much use of it in the treatment of lupus and other skin diseases. (*See also* LIGHT TREATMENT.)

FIRST AID.—Many occasions arise in which it is not possible to secure the aid of a doctor at a moment's notice, and it is often necessary to give a certain amount of treatment while waiting for medical help to arrive. This emergency treatment is called First Aid, and the many aspects of this important subject will be found under the special FIRST AID SUPPLEMENT at the end of the book.

FISH-HOOK WOUND.—A fish-hook wound is a very troublesome thing to deal

with, but the only way to extract the hook from the finger is to push the hook *forward* until the point and barb are seen quite plainly. The whole barb should then be cut off and the rest of the fishing hook can be pulled out without further trouble. A little iodine should be painted over the wound after it has been thoroughly washed and a dressing applied in order to prevent dirt from causing infection.

FISH-SKIN DISEASE.—This is a disease in which the skin has the appearance of the scales of a fish. It is technically known as ichthyosis. (*See also* ICHTHYOSIS.)

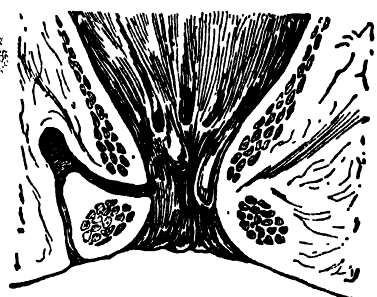
FISSURE.—The term fissure has really two meanings in medical language. In dealing with the anatomy of the body, fissure is used to describe various clefts which occur in the region of the brain, while in surgery the term fissure refers to cracks in the skin or mucous membranes.

Anal Fissure.—The commonest part of the body for a fissure to appear is at the margin of the *anus*, which is the lower opening of the bowel. The crack, which usually develops into a small ulcer, is almost always caused by the passage of hard motions.

Symptoms.—Although the ulcer may be very small in size, it can create a life of misery until the place is healed. Every time the bowels are opened, severe pain follows. The pain is not only felt around the crack or fissure itself, but may extend up the back and down the thighs and it may last for hours after movement of the bowels has taken place. As a result, anyone who suffers from an anal fissure refrains as much as possible from going to stool, thereby setting up a vicious circle. Naturally, by holding back the motions, they become harder and more bulky, so that when the evil hour cannot be put off any longer the sufferer only experiences more pain than ever. A situation like this cannot hope to be cured unless definite steps are taken.

Treatment.—In early cases healing may be brought about by attention to the patient's general health. Constipation is usually the start of the hard motions which causes the crack in the anus, so laxatives such as cascara or castor oil should be given. In order to prevent pain when movement of the bowels takes place, special suppositories may be used; these will deaden the painful area around the anus or back passage and encourage the sufferer to go to stool whenever required. After each motion the parts around the anus should be sponged with warm water. This treatment will not be found sufficient for a case that has developed into an ulcer and it will be necessary for the patient to undergo a slight operation. It is a very simple matter for the surgeon to cure the condition, and it is advisable, at the same time, to have the condition of the lower part of the bowel investigated in case there may be anything present which would cause a recurrence of the mischief.

Fissure of the Nipple.—Unless due precautions are taken to harden the nipples and prepare them for suckling before the baby is born, cracks or fissures may appear and



Fistula *in ano*

cause endless pain and trouble. The best way to prevent cracking of the nipples taking place is to bathe them immediately after nursing, and then to dry them thoroughly. If they are at all tender, a little boracic acid powder and starch should be applied at intervals. If cracks have formed, then the nipples must be kept covered with a piece of lint soaked in boracic lotion until they heal. (*See also* PREGNANCY.)

FISTULA.—Fistula is the name applied to any unnatural narrow channel or passage which leads from one cavity of the body to another, or which opens out from a cavity to the surface of the body. There are many varieties of fistula, but one of the commonest forms is that known as anal fistula, or fistula *in ano.*

The condition may be a simple or a very complicated affair, and the term anal fistula is usually applied to all the conditions in which chronic discharging openings are found near the anus or the lower end of the rectum. These channels or passages may spread in all directions and have many openings.

Some may open on to the skin externally, or into the bowel internally, while others communicate both with the bowel and the outer surface of the body. There is more or less a constant discharge of pus or matter from these narrow openings, and, since the contents of the bowel usually are able to enter into the fistula, healing may be prevented.

An anal fistula is commonly due to the presence of an abscess which has been allowed to drain into the bowel or out on to the surface of the skin. The proper opening and draining of an abscess anywhere in the region of the anus would do much to prevent a fistula occurring. There is a type of abscess which appears in the neighbourhood of the lower part of the bowel which is usually a complication of tuberculosis. These



Flat Foot:
A—Imprint of normal foot; B -Flat Foot

abscesses if not treated properly are apt to end in the condition of fistula *in ano*.

Treatment.—It is most unusual for any fistula to heal by itself without operation. Every part of the fistula must be thoroughly treated, and after the operation, complete rest will have to be taken.

FIT.—The word fit, generally speaking, means a seizure of some sort or another. For example, we talk of a fit of coughing, or of weeping or of temper, and many other things; but in medicine, the term fit is used in connection with convulsions or any other abnormal movements of the muscles.

A fit or seizure is not a disease in itself, but it may be the result of some disorder of the body. Epilepsy is by far the most common cause and in this condition there is usually a slight warning (aura) which may consist of flashes of light or noises in the ears and the patient may give a loud scream before he falls to the ground. Infantile convulsions may, or may not, have some serious cause behind them, as it is quite common for a child to have a slight attack of convulsions owing to wrong diet or some infection in the bowels.

Tumours which cause pressure on the brain may cause convulsions, and also they may follow large doses of certain drugs such as strychnine, arsenic, atropine and alcohol. The most common one is strychnine, and these convulsions commence with great violence and the whole body is affected. During these attacks the hearing and sight of the sufferer is very acute and he is painfully aware of his condition. Tetanus, or lockjaw as it is more popularly called, is an infectious disease in which violent and painful convulsions occur which are very similar to strychnine poisoning.

There is a disease of the kidneys known as uræmia in which fits frequently occur, and during pregnancy some kidney trouble may arise in which similar fits take place. This condition, which is quite a common one in pregnant women, is known as eclampsia.

Many and various mental conditions are responsible for fits, and hysteria is one of the most common forms. For treatment of infantile convulsions *see* under the heading INFANTS, CONVULSIONS IN; and treatment for an ordinary fit is given under EPILEPSY. (*See also* CONVULSIONS; ECLAMPSIA; EPILEPSY; FAINTING.)

FLAT-FOOT.—It has been said that flat-foot is almost a national disease with us, and it is very noticeable that English boots and shoes are made rather for people with low or fallen arches to the feet than for high-arched feet. But although flat-foot in a slight degree is very common in Britain, for most people it is nothing to worry about except from the point of view of personal appearance. There are, however, many cases where flat-foot can be a distinct handicap and lead to pain and discomfort.

The normal well-shaped foot has two natural arches. A larger arch extending the length of the foot from the pads of the toes to the heel, and a smaller arch extending across the foot from the ball of the big toe to the little toe. These arches of the foot may give way through weakness of the supporting muscles and flat-foot results.

To tell when flat-foot is present, wet the foot and stand on a piece of dark coloured linoleum. The outline of the foot can be

plainly seen for a few minutes and can be compared with the outline of a normal foot.

Treatment.—The treatment of flat-foot is by means of special exercises which are easy to perform and if persevered with will give a very good result. These exercises are described and illustrated in the article on REMEDIAL EXERCISES. Any defect in the balance of the body such as a raised shoulder, longer leg, spinal curvature should be corrected with regard to its effect on the feet as much as possible. This can usually best be done by wearing specially built-up shoes. The general health may need toning up, as some people have slacker arches when their muscles are weak through general debility. Massage to the feet may help. People with flat feet should learn to walk with the feet pointing straight ahead instead of toes turning out as so many people do. A slight degree of flat-foot is greatly improved and may be cured by simple means, but if the condition is allowed to progress it may be a more serious matter. The weight of the body will fall on parts of the foot that are not meant to support it and bad corns are the result. Also the bones of the foot press on the ground and become inflamed until it may be agony to put the foot to the ground. The muscles of the leg become strained and pain may be felt in the calves of the legs and in the thighs. In older people who have put on weight, it is very often necessary to obtain support for the arches of the feet by wearing a special supporting appliance in the shoes. These artificial arches give instant relief to the pain caused by the flat-foot, but as they are not curative to any great extent; it is better for younger people to make an effort to improve the arches of the feet.

FLATULENCE.—Flatulence, which is also called flatulent dyspepsia, is a condition in which there is a tendency for wind to collect in the stomach. This wind may be expelled at intervals by belching or retching, or it may be retained in the stomach causing it to be dilated and uncomfortable. Flatulence may be due to intestinal, gastric or nervous causes. Intestinal and gastric flatulence usually appear together owing to some unhealthy state of the organs of digestion, such as excessive fermentation going on in the bowel or stomach. This sort of flatulence is therefore to be treated in the same way as the indigestion which causes it, and the article on INDIGESTION should be read by those interested in it.

Nervous Flatulence.—The condition known as nervous flatulence is generally due to air-swallowing, a nervous complaint in which air is continually being swallowed into the stomach. This condition is described under its medical name of *Aerophagy.*

Flatulence in Preganacy.—Flatulence is often an uncomfortable accompaniment of pregnancy, but disappears afterwards. If the discomfort is very great, retching will "bring up the wind," but pregnant women should always remember that anything in the way of straining should be avoided if possible. (*See also* PREGNANCY.)

FLEA.—Fleas are one of the commonest pests that plague us, and they used to be far worse a nuisance before the days of the vacuum cleaner. The vacuum cleaner has made bus or railway travelling an enormously cleaner business than it used to be, and it is almost a rare thing nowadays for the traveller to pick up a flea in a railway carriage unless he happens to have been sitting near an infected person. There are said to be hundreds of varieties of fleas, but for ordinary purposes we are content to recognize two varieties only, those that live and feed on human beings and are called *pulex irritans*, and those that live on cats and dogs and other small animals. It is commonly thought that animal fleas will not live on people and that human fleas do not attack the domestic pets; but this is not so in all cases, though as a general rule it is true. The fleas that infest rats, however, will freely attack human beings and by their means terrible outbreaks of plague have been directly caused. The two great epidemics in our national history, the Black Death in the fourteenth century and the Plague of London in 1665, were said to have been caused by fleas spreading the infection. Plague no longer occurs in epidemic form in England, but there are always odd cases of it amongst people living in, or working in, the neighbourhood of docks. It has been proved that rats can escape from ships which are lying in dock by swimming ashore or coming ashore on gangway planks or by means of cables. If these invading rats have plague as sometimes happens, the fleas they carry may bite someone and thus transmit the germs of plague to his blood.

A flea is a tiny brown, hard-skinned animal with one eye, six legs and a long proboscis with which it pierces the skin of its victim and sucks his blood. Their bite leaves a small red irritable spot which fades away after a few hours.

Fleas and Infection.—As has been mentioned, fleas from rats are the means by which plague is spread from person to person so it seems likely that other diseases may be carried by fleas, and in the War, trench fever was caused by fleas.

To prevent the spread of fleas the usual measures of cleanliness are sufficient for most people. As soon as the presence of a flea on the person is suspected it is a good plan to undress in the bathroom beside a bath full of water. As each garment is removed it should be shaken over the water, and it is very likely that before the last garment is reached the flea will have been shaken into the water where it will float on the top unable to hop away. A flea, however, is a very difficult little insect to kill. Quite the best way is the crude and perhaps unpleasant way of "cracking" them between the nails of the two thumbs. A flea-infested house presents a difficult problem, but repeated cleaning will in time usually get rid of the pest. The floors and woodwork must be thoroughly scoured, and all holes such as mouse-holes and cracks in the flooring and walls should be blocked up. Naphthalene and other powders such as are used for moth killing may be sprinkled about and put in cracks, etc.; bedding should be washed or sent to the cleaners, and curtains, cushions, etc., should be cleaned, washed or stoved. After the house has been brought back to a normal state of cleanliness, the use of a vacuum cleaner from time to time will keep it clean, provided the flea-containing dust is burnt and not just thrown out for the insects to breed again.

FLIES.—"All Nature," said Pasteur, the great French scientist, "is a miracle." Flies are wonderfully made, and their life story is of great interest to the naturalist, but to the housewife they are nothing but a pest; she kills them, and rightly, for they are dangerous little creatures to mankind.

With the coming of the motor, one might have imagined that the fly would go elsewhere. For the favourite breeding-place of the common house-fly is fresh horse manure that has lain for not more than twenty-four hours. In this the female fly lays her eggs, perhaps as many as a hundred and fifty at once. If she cannot find any fresh horse manure, she finds something else equally soft and warm, such as the contents of an outside closet, or decaying refuse in an open dust-bin or on a rubbish heap. She is a busy insect, and wastes no time. It looks as if she lays at least a thousand eggs during her life-time; and as the egg may hatch in a few hours in favourable circumstances into the maggot, and this does not stay longer than it can help underground, in a few weeks, say four or five, the new fly is ready to follow in its mother's footsteps, and begin laying its own eggs.

It follows its mother's footsteps in a very literal sense, and those footsteps are a real and serious danger to us. For on the fly's feet are all sorts of filth. Remember where it was bred, and think of its habits, its liking for dirt, not only to breed in but to eat.

Now, supposing that there was the germ of any disease in the filth which the fly thus leaves on our food. It is well known that this is one of the ways in which disease germs are distributed, and that some of the more serious illnesses are carried in this way by flies. Among these are anthrax—an illness to which butchers, shepherds, woolsorters and others who work among animals are liable; cholera, which is common in tropical countries where flies abound; diphtheria, one of the most deadly of children's diseases; dysentery which, like cholera, is common in tropical countries; enteric, or typhoid fever, also called low, gastric, or drain fever; ophthalmia, especially the Egyptian form of it, which accounts for most of the cases of blindness in asylums for the blind, to say nothing of the poisoning of food, which may lead to serious illness.

Just as the spider has its own ways of dealing with flies, so we, if we are to keep our houses free from the pest must learn to be ingenious in our methods.

We can entrap the flies by one of the fly-traps now on the market, or we can make our own traps. Formalin, lime-water and brown sugar may be used, in the proportions of about a teaspoonful of formalin to half a pint of lime-water and a generous tablespoonful of sugar to make it palatable, for flies enjoy sweet things, as we all know. Or

we may prefer to "swat" them with one of those gauze covered weapons sold for the purpose. A point to bear in mind is that flies dislike wind and moving air, and that a thorough draught will get rid of them for the time being. The great thing is to keep walls and ceilings swept, and, especially in spring and summer, windows and doors open whenever possible; it is advisable too to look to hanging electric globes, where flies often congregate. In a word, cleanliness is the best safeguard against the fly pest.

Flies are attracted by perspiration, and they will also settle on an open wound or sore, or on a baby's sore eyes. Precautions should be taken against this when the baby is put out in the perambulator.

Blowflies.—Well does the housewife know the sound of the bluebottle! But she may perhaps not have realized that the meat cover is not enough protection against this pest. For the blowfly, or meat-fly, if it cannot get to the meat, will not scruple to lay its eggs on the very meat cover itself, and they may drop through the mesh on to the joint we thought we were guarding so carefully. It is wise, therefore, to have a piece of finely-meshed muslin over the meat, or over the cover.

Farmyard Flies.—Where horses are kept, special care should be taken to stack the manure closely, so that the heat caused by fermentation may kill the fly maggots. The stack may be kept in a state of fermentation by moisture, or it may be broken up, scattered and dried, hard dry lumps not being attractive for breeding.

Flies and Outside Sanitation.—The maggots, when they come out of the egg, burrow down into the ground and "go to sleep" for a while, perhaps a week or longer, according to climate, weather conditions, etc. When the fly is formed, it comes up through the ground, and although for another week or so it may be harmless enough, it soon becomes ready to lay its eggs, and then the trouble begins. If, therefore, the house sanitation is outside, and consists of an earth closet, every care should be taken to see that the floor is solid and that there are no cracks at the lower part of the walls through which these insects can creep. It is no exaggeration to say that some old-fashioned closets with their earthen floors and rotten woodwork may be hotbeds of disease.

It should be hardly necessary to add that dust-bins should be kept scrupulously clean, and that the lids should fit tightly, more especially in summer when the flies are breeding. This applies to a climate like our own; in hot countries flies breed all the year round.

FLOATING KIDNEY.—As a general rule the kidneys are attached firmly in their normal position in the abdomen, but it sometimes happens that one or other kidney, usually the right one, is more loosely attached and is able to move from its normal position. This is called a floating kidney. Floating kidneys are fairly common and usually cause no symptoms at all, but sometimes there may be pain and discomfort to such a degree that an operation may have to be performed to anchor the kidney in its proper position. (*See also* KIDNEY.)

FLOODING.—Flooding is a popular term which is commonly used to mean excessive bleeding from the womb at any time or at any age. The various causes of flooding are here outlined, and further information should be sought in the articles on the conditions mentioned in connection with flooding.

Flooding in Pregnancy.—Flooding during pregnancy is always a danger signal and requires instant attention. It is usually the first sign of a threatened *miscarriage*, and if recognized and taken in time the miscarriage is sometimes prevented. This usually occurs at the end of the third month of the pregnancy, which is a time when special care should always be taken. Another condition which gives rise to flooding during pregnancy is a conception taking place in one of the tubes instead of in the womb (*ectopic gestation*). This is a very serious condition and calls for immediate operative treatment. There may be a misplaced afterbirth (*placenta prævia*), and this also is a very dangerous condition unless it is properly treated, as both the mother and the child may lose their lives at the time of the confinement owing to the afterbirth coming away before the baby, causing uncontrollable bleeding.

Accidental Hæmorrhage is a condition where there is sudden bleeding during pregnancy owing to the partial separation of the afterbirth leaving a raw bleeding surface on the side of the womb. It is not caused by an "accident" but usually

by an unhealthy condition of the afterbirth. It is a serious condition and requires immediate medical attention.

Hæmorrhage due to Double Womb is a variety which has been known to occur. The bleeding in this case, which is due to an abnormality of the womb present from birth, would show itself as a continuation during pregnancy of the usual monthly periods.

Flooding after Childbirth.—Flooding immediately after, or perhaps a few days after, the baby is born is usually due to a portion of the afterbirth remaining behind and preventing the womb from contracting down and sealing up the blood-vessels as it normally does.

Treatment.—The treatment in these cases is to empty the womb of anything that may have been left behind as speedily as possible. Massage of the womb through the abdominal wall may help and drugs given by the doctor such as pituitrin, quinine and ergot are helpful. In some cases hot douching into the womb may be necessary. The great danger when the afterbirth is partially left behind is that it may cause blood poisoning, a very grave complication of pregnancy.

Flooding after childbirth may also be caused by *injury to the parts* caused by the passage of the baby's head or by instruments which have been used. Such cases are usually stitched by the doctor in attendance, thus controlling the bleeding and repairing the damage. Occasionally the womb becomes partially turned inside out (inversion of the uterus) when the patient has had a very bad time during labour. This condition causes severe bleeding until it has been put right again.

Flooding due to Change of Life.—It is quite common to have attacks of flooding round about the age of 44 years, and it may merely mean that the patient is "on the change," but at the same time it is very important that every woman who is flooding at this age should be examined internally by a doctor, as it is the most common age for a cancer of the womb to develop and bleeding may be the first sign to draw attention to it.

Puberty.—Some young girls suffer from excessive bleeding at the onset of their periods, and care must be taken of these girls to ensure that too big a strain is not put on their strength until they have become more accustomed to their periods.

Tumours.—Tumours of the womb are a frequent cause of bleeding. The most common are the fibroid tumours, of which there may be many or only one present, and which may grow to a very large size or may remain very small. Their removal is usually advisable, and this may be done in several ways, for example, the application of radium, electric treatment, and removal by operation. Other tumours which cause flooding are *polypi* (tumours hanging by a stalk from the neck of the womb), ovarian tumours, and cancers.

Endometritis.—This means an unhealthy condition of the womb and is usually accompanied by excessive bleeding at the periods. It is usually caused by a germ or by a misplacement of the womb.

Blood Diseases.—Flooding is common in blood diseases such as *purpura* and certain sorts of *anæmia* both primary and secondary to some other disease or to an operation. The treatment in these cases is to try to cure the original disease causing the anæmia.

Gland Diseases and Debilitating Diseases.—Flooding may occur in cases such as exophthalmic goitre (Graves' disease) diabetes, scurvy, heart disease, etc.

Treatment.—In all the cases of bleeding the cause should be discovered and treated and, as has been said, the causes are very numerous and diagnosis is not always easy. The treatment, too, may be very lengthy. In cases of *sudden* excessive bleeding from the womb, the patient should be put in bed, lying flat without a pillow and with the bottom of the bed raised on two kitchen chairs. While awaiting the arrival of the doctor, kettles of boiling water should be prepared ready for hot douches, also clean bowls and towels should be placed ready and rolls of cotton-wool and plain white gauze and any disinfectant there may be in the house such as iodine, carbolic, Condy's fluid, or lysol. In cases where the patient is known to be pregnant a *very* tight binder round the abdomen is helpful, and so is pressure downwards with the hand placed on the upper border of the womb. Stimulants and hot drinks are likely to make the bleeding worse and should not be given until the doctor gives permission, but there is no harm in drinking as much cold water as the patient wants. In all cases of flooding, anything which comes away should be carefully kept for the inspection of the doctor.

FLUKE.—Flukes are a class of worm which lives in human beings or in animals. They are to be found in tropical countries. (*See also* BILHARZIA; WORM.)

FLUORESCEIN.—This drug is chiefly used to indicate the presence of ulcers in the cornea of the eye. A few drops composed of fluorescein, bicarbonate of soda and water, when dropped into the eye will cause the ulcer to show up by turning it bright green.

FŒTUS.—Fœtus is the name given to the child after the fifth week, while it is beginning to develop within the womb of the mother.

FOG.—Fog is connected, in most people's minds, with stoppage of traffic, or at least with delays in getting along the streets; with the dismal sound of fog-signals on the railway line, or fog-horns at sea.

Fog has been described as "a cloud, thick enough to hinder traffic, and lying near the surface of the land or water." Often it comes on suddenly; it is erratic—sometimes enveloping several counties in a wet blanket, leaving other parts of the country clear.

Fogs are more frequent at sea in spring and summer, on the coast in winter, and inland—well, we speak of "November fogs" as a matter of course, though frequently that month is bright and clear, as we speak of "April showers" and "June roses."

We are most of us familiar with the heavy fog that lies sometimes over our cities and towns, when the air is thick with sulphuric emanations from innumerable chimneys, and our houses and public buildings are coated with grime. In Westminster, for example, extensive and expensive overhauling of Big Ben's tower has recently become necessary, largely owing to the accumulation of deposits left on the walls by the smoke of the millions of tons of coal used every year in London.

The question of smoke abatement has been discussed for years, and there is no doubt that it would mean not only a saving in fuel but better and purer air, while from the housewife's point of view the labour of keeping the house clean would be greatly lessened. True, we should still have fogs, but they would not be so depressing and dirty.

Those who have lived in London for many years agree that fogs are less frequent than they were, and it seems probable that as we use more electric power and the products of coal—gas and coke—and less of coal itself, our old friend the London "peasoup" fog may one day live only in the memory of the oldest inhabitant.

FOMENTATION. — A simple means of relieving pain can be carried out by applying hot wet flannel or lint to the part of the body which is inflamed. This is known as applying a hot fomentation. The flannel or lint should be folded so that two or more layers can be used. If a very hot fomentation is required, it will be better to use only two layers and change the application at frequent intervals, but if the fomentation need not be so hot, six or even eight layers should be used and the fomentation will retain the heat for a good long period.

In order to heat the flannel or lint, it should be cut to the desired size and laid out on a small roller towel through which a stick has been inserted at each end to make the wringing of the towel an easier matter. The towel and flannel, or whichever material is being used as the fomentation, is then placed in a basin and boiling water is poured over it until it is thoroughly soaked. The towel, with the fomentation inside it, is then wrung out as thoroughly as possible by holding a stick in each hand and twisting them in opposite directions. It is carried in the towel to the bedside in order to keep the heat in, but before applying the hot fomentation it should be opened out and shaken a little, and great care must be taken that it is not so hot that it will burn the skin of the patient. The hot wet flannel or lint must be covered as quickly as possible with a piece of mackintosh or oiled silk which has been cut a little larger than the size of the fomentation. A large pad of cotton wool should be placed over this, and the whole kept in position by a bandage or flannel binder.

A fomentation applied in this way will keep its heat for a few hours, but if the pain is intense it may be necessary to renew the fomentation every half hour. The hotter the fomentation the quicker the pain will be relieved, but again it must be advised that great care must be taken not to scald the sufferer. Sometimes the effect of the fomentation will be increased if a teaspoonful of oil of turpentine is sprinkled over the flannel or lint just before it is placed on the





Above: **Requisites for a Hot Fomentation. Towel in basin, boiling water, bandage, lint and mackintosh, cotton wool.**

Right: **Boiling water poured on lint placed on towel in basin.**

Below: **Towel twisted round lint, twisting out the hot water.**

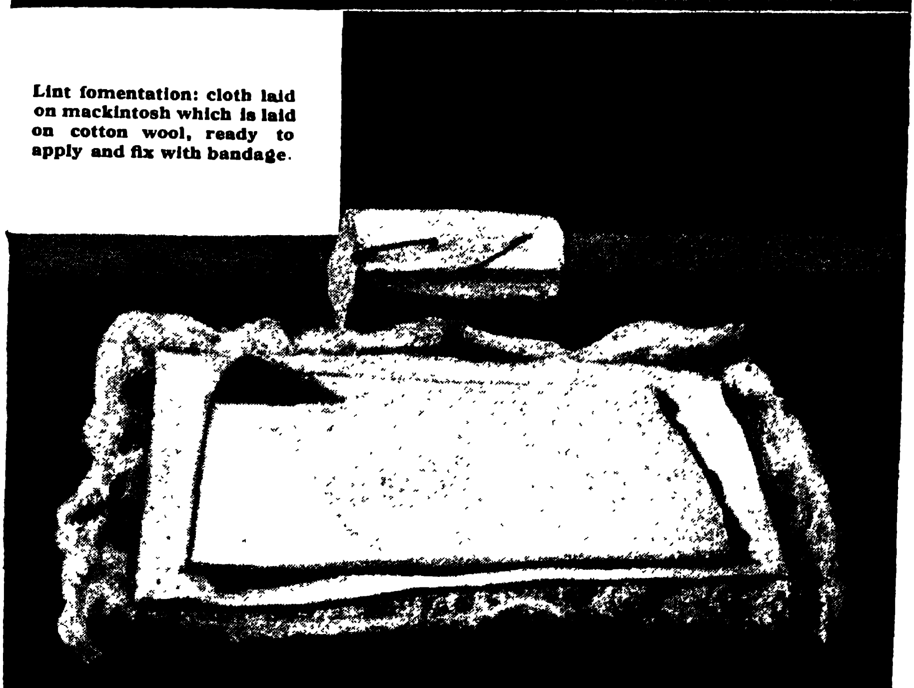


How to make a Fomentation.—1.

Shaking the hot, damp lint fomentation cloth to admit air between folds.



Lint fomentation: cloth laid on mackintosh which is laid on cotton wool, ready to apply and fix with bandage.



How to make a Fomentation.—2.

skin. Spongio-piline is a material which is very often used as a fomentation instead of flannel or lint. It consists of a thick pad of felt which has a backing of india-rubber and is specially manufactured for the purpose, but flannel or lint do quite as well and they are usually at hand. Wounds, ulcers, etc., are often treated by putting on boracic lint, wrung out of hot water and covered with a piece of oiled silk and a bandage.

FOMITES.—The term fomites is used to describe any article of food or furniture which is capable of harbouring the living germs of disease while they are not in the human body. Infectious diseases are often spread in this way, or they may be spread by flies, etc., or human beings may act as carriers. (*See also* DISINFECTION; GERMS.)

FONTANELLE.—The space between the bones of the head which is present in newly-born children is known as the fontanelle. Great care must be taken of the head until these bones join together, which usually happens by the age of eighteen months. Children who suffer from rickets or other wasting diseases do not develop as quickly as normally healthy children, and in them the closure of the fontanelle may be considerably delayed. (*See also* SPECIAL SUPPLEMENT ON BABY.)

FOOD.—The whole subject of food is such an important one from the health point of view that a special supplement has been added dealing with it in its different aspects. (*See also* SPECIAL SUPPLEMENT ON DIET AND INVALID FEEDING.)

Appetite assists digestion. Tasty food, carefully cooked and daintily served, stimulates the appetite. Another essential is variety. Human beings—the so-called civilized races at all events—soon tire of an oft-repeated dish. Changes should be skilfully rung and the diet varied as widely as possible.

The function of food is twofold. It builds up and renews the tissues of the body and it supplies warmth and energy. Foodstuffs, therefore, fall into two principal classes. They are either "flesh-formers," called *proteids*, or givers of warmth and energy, called *carbohydrates* and *fats*.

Proteid food is essential. Without it life is impossible, for neither carbohydrates nor fats can replace the wear and tear that takes place in the tissues of the body. On the other hand carbohydrates and fats are not absolutely necessary, for surplus proteids, after the flesh-forming needs have been supplied, can give to the body warmth and energy. But this is a costly and unnatural method.

It is generally held that ample protein in the diet promotes mental energy, a healthy nervous system, and high resistance to disease, and that shortage of this kind of food breeds reverse conditions. What constitutes an adequate proportion varies rather widely according to the circumstances of life. Generally speaking, a man at rest in a temperate climate or leading a leisurely life needs one part of protein to five parts of carbohydrates and fats in his diet; but if working very hard, not only will he need more food, but he may need as much as one part of protein to three and a half parts of other nutrients.

This proportion is called the "nutritive ratio," and a diet consisting of the correct quantities of protein, carbohydrate and fat for the needs of the consumer is said to be a "balanced" diet.

Proteids.—Most foodstuffs contain both protein and carbohydrate, but in very different and varying proportions. All proteids contain *nitrogen*, the element that repairs the tissue waste in the body. They abound in meat, fish, milk, eggs, peas and beans.

Carbohydrates contain *carbon*, and are found in starch, sugar and similar compounds. Cereals are rich in this food element.

Fats and Oils, like carbohydrates, contain carbon. Their function is also to supply heat and energy, but they act more slowly. The principal source of animal fat is butter, then bacon, mutton chops and cheese. Oils are abundant in the fruits and seeds of many plants, such as the palm nut, Brazil nut, almond, olive, etc.

Mineral Salts.—The above are the principal food elements, but in addition the human body needs a small quantity of mineral salts of potassium, iron, calcium and phosphorus to build up the blood, brain, bony and nervous structures. Such salts are usually present in food, and only actual starvation is likely to deprive the adult body of the necessary amount. But growing children and pregnant or nursing mothers have special need of calcium and phosphorus. They should have plenty of milk and eggs, which contain a lot of these two elements.

Cellulose is the name given to the fibrous bulk of many foods. It is not digested in the human body, but is none the less very important because of its mechanical action in helping the passage of the food along the intestines.

Vitamins.—These are subtle chemical food factors, lack of which breeds so-called "deficiency" diseases, such as rickets, scurvy and beri-beri.

The principal vitamins are:

Vitamin A, present in milk, cod-liver oil and animal fats. Vitamin B, present in milk, outer layers of cereals, yeast and orange juice. Vitamin C, present in fresh fruit and vegetables, especially oranges, limes and tomatoes. Vitamin D, present in cod-liver or halibut-liver oil.

Water is an essential part of the diet. It not only keeps the digested food in solution, thus aiding its movement in the body, but it also stimulates the digestive juices and aids in flushing the intestines. Several tumblers per day may be taken with advantage.

Milk and its Products.—Milk is a nearly perfect food. It contains protein, carbohydrate, fat, vitamins A and B, and several mineral salts, but no iron.

Cream and Butter both contain large amounts of fat, are rich in vitamin A, and are valuable, nourishing foods. In reasonable quantities they are easily digested and should always be included in the diet of persons who are underweight. They should be strictly limited in, but not entirely excluded from, the dietary of those who are too fat.

Butter Substitutes are made from vegetable fats. They have equal fuel value to that of butter, but they lack vitamin A. If used instead of butter, the diet should include milk to make good this deficiency.

Cheese is one of our most nutritious foods. It contains protein as well as fat, and may therefore take the place of meat.

Yoghourt is curdled milk prepared by means of a special ferment. It originated in Bulgaria, where it is largely taken by the peasantry. It is highly nutritious and easily digested, but its special virtue is its power of disinfecting the intestines. Yoghourt is commonly prescribed by continental doctors as a most valuable food in wasting diseases, and in cases of enfeebled digestion. It can be readily prepared at home, but care should be taken that the genuine Bulgarian ferment is obtained. The chemist who furnishes the ferment will give the necessary instructions as to its use.

Eggs are rich in protein and fat, and, like cheese, are poor in carbohydrates. Bread, macaroni, or some other starchy food should therefore be taken with them. They are rich in iron, phosphorus, and vitamins.

The digestibility of eggs largely depends upon the individual, but to some extent upon the method of cooking. The egg lightly poached or boiled passes more quickly through the stomach than when hard-boiled or served as a heavy omelette.

Meat, like cheese and eggs, is rich in protein and often in fat, but lacks carbohydrate. If, therefore, much of it is eaten without compensating vegetables or starchy foods, digestive disorders, such as constipation, are likely.

Chicken and pigeon are more readily digested than beef; but duck, turkey and goose are not.

Beef extracts contain little protein. They do contain most of the salts and the purines, i.e. extractives which give meat its appetizing flavour. Thus they whet the appetite and stimulate digestion.

It is becoming more and more widely believed that meat is not a physiological necessity to man since eggs, cheese and milk provide proteins of animal origin, while a host of vegetables, pulses, and cereals contain this essential food element. Asiatic races, such as the Sikhs or Japanese, are largely vegetarian and yet are hardy and strong.

Meat as a food has certain drawbacks. It has been claimed, not without reason, that some digestive disorders are the result of intestinal putrefaction directly due to an excess of meat in the diet. However that may be, Western nations like meat and the annual consumption per head in a country increases with that country's prosperity. For example, in Germany, consumption of meat per head of the population rose from 72 lb. in 1892 to 115 lb. in 1912, and many Asiatic races would eat more meat if they could afford to do so.

Fish, like meat, has a high protein, low carbohydrate, and variable fat content. On the whole fish is more easily digested than meat, for which it is an excellent

substitute. Whiting, sole, and cod contain little fat and are therefore more easily digested than halibut, herring, mackerel, and salmon, all of which are rich in oil.

Vegetable Sources of Protein.—Protein is found in the vegetable kingdom, most richly in the pulses. Lentils, peas, beans, in fact the grains of all leguminous plants, contain abundance of this element.

The Carbohydrates.—Cereals are the most important of the group of foods in which carbohydrate predominates. Barley, wheat, oats and rye, etc., contain from 58 per cent. to 71 per cent. of carbohydrate and a larger quantity of mineral salts than foods rich in protein, such as eggs, meat, fish and cheese. To such foods cereals form an excellent supplement.

In Europe and America bread is the commonest cereal food and may be either white or wholemeal, wheaten or rye. In Asia rice is the staple diet; in Africa maize.

Other grain foods are barley, oatmeal, sago, tapioca, etc.

Vegetables and Fruit are very important foods. They contain the precious vitamins and are rich in mineral salts and cellulose. Potatoes and beetroots are also rich in carbohydrate; but, except for the pulses, vegetables as a rule are deficient in protein.

Sugar.—Cane-sugar is practically pure carbohydrate and in moderate quantities is readily digested.

Nuts have a high protein content and are widely taken by vegetarians to replace protein of animal origin. It is a moot point whether these vegetable proteins have the same biological value as those contained in dairy produce.

Condiments are the spicy substances whose judicious use whets the appetite and stimulates digestion. Pepper, mustard, horseradish and vinegar are typical condiments.

Quantity of food required.—It has been calculated that a full-grown man, doing average work, needs daily about 4½ oz. of protein, 3 oz. of fat, 12 oz. of carbohydrate, 1 oz. of mineral food, and 5½ lb. of water. The total ration would weigh about 7 lb. after allowing for other substances, such as cellulose and colouring matter, which are present in most foods.

As we have seen, most foodstuffs contain both protein and carbohydrate, some being rich in one, and some in the other. For example, if the diet were confined to wheaten bread, 4 lb. would have to be eaten to supply the needed 4½ oz. of protein, and then the amount of carbohydrate taken would be 2 lb. or double the quantity needed.

But if we take some other protein-rich food, such as cheese, and add ½ lb. of it to 1 lb. of bread, we get 12 oz. of carbohydrate, 4 oz. of protein, 2½ oz. of fat, and about ½ oz. of mineral salts. In this way balanced rations are planned.

As has already been said, variety is essential and a diet of bread, cheese and water, though able to sustain life, would become deadly dull. A mixed daily diet to provide the above quantities of food elements is given below.

Bread, 18 oz.; butter, 1 oz.; milk, 4 oz.; bacon, 2 oz.; potatoes, 8 oz.; cabbage, 6 oz.; cheese, 3½ oz.; sugar, 1 oz.; salt, ¾ oz.; water, 66¾ oz. Total, 111 oz. or 6 lb. 15 oz.

In this ration the sugar and potatoes supply carbohydrate; the bread supplies carbohydrate and some protein; the milk gives protein, carbohydrate and fat; the bacon and butter furnish chiefly fat; and the cabbage provides cellulose and mineral salt, the rest of which is found in the salt itself.

FOOD CONTAMINATION.—By food contamination we mean the spoiling of food substances by mixing with poisonous materials or by infection with germs. Since food is a necessity for us all and is partaken of several times every day by most people, it follows that food must be one of the principal ways by which germs and poisonous substances find their way into our bodies. It behoves us, therefore, to take precautions against food contamination. Of the food substances in everyday use, milk is probably the easiest means by which germs are carried. It may come from an infected animal such as a tuberculous cow, or it may be handled by infected persons and it provides an excellent breeding ground for germs, so that they may actually teem in it. To prevent wide-spread disease from milk, therefore, there is inspection of the cows, pasteurization of the milk and sealing of the cans in which it travels. Meat is the next best breeding-ground for germs, and many outbreaks of food poisoning have come from contaminated meat. It is wisest in warm weather, which is the best breeding weather

for germs, to heat all meat pies, sausages, etc., to a high temperature before using them. Shell-fish are a fruitful source of infection, too, because they live at the mouth of rivers and sometimes feed on sewage. It is said by some authorities that the most frequent cause of typhoid fever in Britain to-day is the eating of shell-fish from water contaminated with typhoid germs.

Fruit and vegetables, especially in warm countries, are frequent carriers of germs, especially of cholera. (*See also* FLIES.)

FOOD POISONING.—Ptomaine poisoning was the name formerly used in connection with food poisoning, as it was thought to be due to putrefaction taking place and producing highly poisonous substances known as ptomaines. It is now believed that the majority of cases are due to infection with germs actually in the food, and rarely if ever to ptomaines. It must be remembered that infected foods, especially meats, are not usually altered in appearance or smell. The meat may become infected from the hands of people who store and deal with it, or it may have come in contact with infected rats, mice or flies. In cases of botulism, which is a variety of food poisoning due to a particular germ, it is only a matter of hours before very definite symptoms begin to appear. Cooking is not always a safeguard against poisoning, because although the germ itself may be destroyed, it may have produced toxins which remain unaffected by heat. Improper preservation of tinned meats, and delay in eating tinned foods once they are opened, are very common causes of poisoning. Foods may also be made poisonous by coming in contact with metals such as copper, tin or lead. Very careful attention should be given to the cleaning of all metal utensils, and food should never be left standing in them for any length of time.

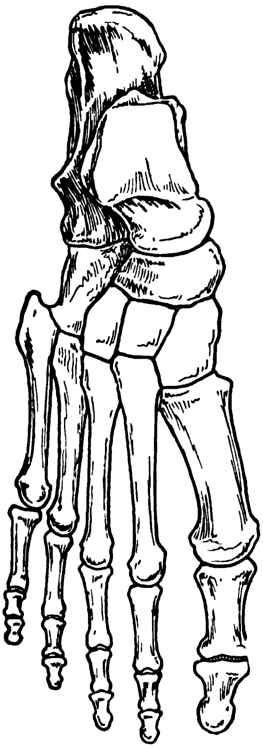
Another type of poisoning is known as *food allergy* in which certain persons may find certain articles of food such as fish, white of egg, certain fruits, especially strawberries, and so on, are definitely poisonous to them, and whenever they take such foods they develop various unpleasant symptoms such as nettle-rash, irritation of the bowel, erythema and eczema, or they may show symptoms of asthma.

Symptoms.—The symptoms of food poisoning usually begin a few hours after the infected food has been eaten, but some cases may not become apparent for 2 or 3 days. The patient usually feels nauseated, and vomiting may take place. The bowels are loose, and later the motions may become very watery. The temperature is raised, and in severe cases the patient may show signs of collapse. In mild cases the feeling of illness may pass off in about two days, and the majority of cases recover completely after a week or so.

Treatment.—The patient should be put to bed and kept warm. An emetic of mustard and water may be given, or the stomach may be washed out with a warm salt solution. Castor oil should be given, but if the diarrhœa persists, a more binding medicine, such as chlorodyne, should be substituted. Precipitated chalk, or Kaolin, mixed with water, is also very helpful in soothing the stomach and bowel and stopping diarrhœa. Pain in the abdomen can be relieved by application of hot-water bottles or by hot flannels. In cases of collapse, hot coffee or other stimulants may be given. During the acute stages, the patient should only be given boiled water or white of egg in water, and the diet gradually increased by adding citrated milk, glucose, arrowroot, custard, eggs and fish. (*See also* BOTULISM.)

FOOT.—The foot consists of the bones that lie below the long bones of the lower leg and their coverings of tissue and the muscle, with the associated tendons, blood-vessels, etc. There are 26 bones in the foot proper, 14 of these form the toes, 5 are metatarsal bones joining the toes to the heel, and the other 7 make up the heel and back part of the foot. In the part of the foot that we know as the heel the *calcaneus* rests on the ground with the *talus* above it. In front of the calcaneus is the *cuboid* on the inside of the foot, the *navicular* on the top of the foot and in front of it the *first, second* and *third cuneiforms*. It will be seen that the foot has additional bony strengthening on the inside of the foot, where the central weight of the body falls. The bones of the foot form two arches. The *lateral* arch, arching from the inside to the outside of the foot, is composed of the calcaneus, the cuboid, and the fourth and fifth metatarsal bones. The *medial* arch, arching from

heel to toe of the foot, is made up of the calcaneus, the talus, the navicular, the three cuneiform, and the remaining three tarsal bones. Either of these arches of the foot may become weakened and lose its curve, thus causing the condition called flat-foot.

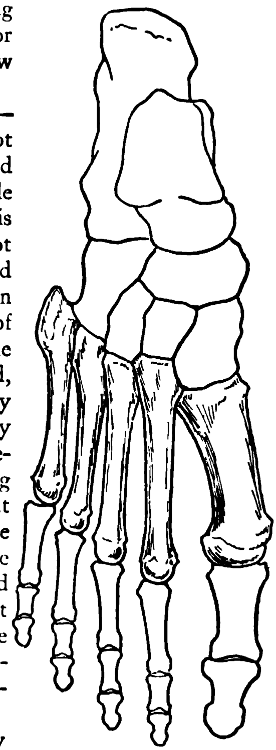


Bones of the Foot

The foot is supplied with blood by the *plantar arteries* (internal and external) on the underneath part of the foot, and the *dorsalis pedis* artery on the top of the foot. There are two sets of muscles which work the foot and toes, those which have their origin in the foot and those which extend from the muscles of the leg. Strong tough tissue, known as the *deep fascia*, covers the muscles of the foot. On the sole of the foot this fascia is known as the *plantar fascia* and forms a firm supporting layer stretching from the heelbone to the ball of the foot.

The foot is protected—by our habit of wearing boots and shoes—from many cuts and injuries it might otherwise sustain, but the pressure of footwear is largely responsible for many irritating corns, callosities and blisters. The treatment of these will be found under the heading CORNS. The general care of the feet is dealt with in the SUPPLEMENT ON BEAUTY CULTURE. Excessive perspiration from the feet is often a troublesome complaint for which *see* the article on SWEAT. Swollen feet are due to various causes. A fluid swelling appearing after a twist or knock to the ankle may be *synovitis*. Feet which swell in the evening may be due to weakness of the heart. Kidney diseases cause swelling of the feet. Varicose veins in the leg are a common cause of swollen feet. Many people are troubled with feet that swell when the weather becomes warm. This is merely constitutional, and the feet subside again as quickly as they swell. Chilblains in winter are another common cause of swelling of the feet. All forms of swollen feet are benefited at once by resting with the feet raised. Simple foot-rests are easily obtained and can be made at home by a handy-man. An excellent and easily made support for one leg is made of two pieces of strong thin wood about six or eight inches broad and thirty inches long. One piece being attached to the other six inches from its end and at right angles. To relieve swollen feet, they should be at a slightly higher level than the knees, so if rest is being taken on a sofa or bed, put a pillow under the feet.

FOOT DROP.— When the foot cannot be raised from the ankle the condition is known as foot drop, or dropped foot. Very often the muscles of the front of the leg are paralysed, and the foot may be permanently dropped as a result. Shortening of the muscles at the back of the leg will cause the foot to drop and become fixed, but it may be possible to cure the condition by operation.



Metatarsal Bones (other bones of the foot in outline only)

Drop foot may be due to some form of injury of a nerve controlling the muscles of the leg or ankle, or the nerves may be diseased as a result of lead-poisoning. Disease of the spinal cord may also affect the nerves and cause the foot to drop. Any symptoms should be carefully watched. (*See also* ANKLE.)

FOOT-AND MOUTH DISEASE.—This disease is known also as epizootic eczema, epidemic stomatitis, aphthous fever, and various other names. It chiefly affects cattle, sheep and pigs, but human beings can develop it through coming in contact with infected animals. Infection may be spread by the discharges which come from the sores, or vesicles as they are called, which appear on the feet and mouth, or it may be carried by the milk of an infected cow.

Symptoms.—When a person develops foot and mouth disease, they may have a slight fever for a few days and then sores will begin to appear in the mouth and round the lips and sometimes on the hands and feet.

Treatment.—Should a case occur, the patient should be put to bed and the sores must be thoroughly treated with antiseptics. Weak solutions of carbolic acid with bicarbonate of soda are very useful as a mouth wash or for bathing the sores.

FOOT-REST.—Anyone suffering from an injured leg, or a patient who has reached the convalescent stage, will find the addition of a foot-rest a great comfort to them while they are up and well enough to be out of bed. As a rule there is no such thing in the house as a chair which is fitted with the proper type of leg-rest, but one can be fixed up with very little trouble and expense.

An ordinary folding card-table can be used by placing it against the edge of an arm-chair, and cushions can be made use of to support the legs as they rest on the slope of the table. A large-sized tray with handles can be used for the same purpose. The handle at one end can be fixed through the cross-bar of an ordinary chair and cushions can be placed on the tray to support the legs. In fact, any flat surface of wood can be made use of as a foot-rest so long as it can be placed at an angle which will allow the patient to rest the legs in comfort, and this can always be achieved with the addition of cushions. (*See also* Foot.)

FORAMEN.—Foramen is the medical term given to openings in the bones which are there for the purpose of admitting nerves and blood-vessels and such-like structures. For example, the foramen magnum is a large oval opening at the base of the skull which transmits the spinal cord and many nerves and arteries. There are many different types of openings situated all over the body and they all have their own particular name.

FORCEPS.—This is an instrument which is used for grasping things which cannot be held in the fingers. The word forceps is taken from a Latin word meaning a pair of tongs. There are many types of forceps used in surgery, as a special set is always required for each type of operation. The nose-and-throat surgeon, for example, uses slender curved forceps for inserting into these parts; while the eye surgeon must have very delicate ones. There are also large ones designed for holding and cutting bone and many other types for each specialized form of work.

FORCIBLE FEEDING.—Forcible or forced feeding is the conveying of nourishment to a patient who persistently refuses to feed himself or to be fed in the ordinary way, or in cases of extreme illness. It is only resorted to as an extreme measure to save life.

It is used in cases of mental trouble, when patients refuse food, and it has been used also in prisons, as for example during the militant agitation for the parliamentary vote for women, when certain women prisoners went on hunger strike.

The method is to introduce the food by way of a soft rubber tube passed through the mouth or nose. Liquid food only is given by this means, such as milk, beaten-up egg or thin broth.

FOREARM.—The forearm is the lower part of the arm between the elbow joint and the wrist. The two bones in the forearm are the radius and the ulna. (For a fuller description *see also* Arm.)

FOREHEAD.—The front of the head just above the eyebrows is called the forehead, the brow or the frontal region. Wrinkling of the brow is controlled by a broad band of muscle which covers the frontal bone, the part of the skull which forms the forehead. In some people this frontal bone is very enlarged, but it is not always a sign of a large capacity for brains as so many people seem to think, but the large and bulging forehead may be due to a thickening of the frontal bone. This very often happens in children with rickets.

In many conditions such as frontal sinus disease, neurasthenia, constipation, or eye-strain, it is not unusual for pain to be felt in the region of the brow. It is quite usual

to hear people say that they have a feeling as if someone was pressing a tight band across their forehead. This very often happens after eyestrain, or neuralgia of the supra-orbital nerve which passes over the forehead. Spots on the forehead are quite common in many infectious diseases, and a seborrhœic rash may spread down from the scalp. (*See also* FRONTAL SINUS; NEURALGIA; SEBORRHŒA.)

FOREIGN BODY.—The term foreign body is used for any substance or article which is in a part of the body where it ought not to be. A fish-hook in the finger, or a fly in the eye, may be given as two very common examples of foreign bodies. In the following list are given a few of the more common places for foreign bodies to become lodged.

Foreign Body in the Ear.—Insects or small seeds of grain, etc., often find their way into the ear and may be the cause of deafness.

Treatment.—The head should be placed on one side and warm water very gently poured into the affected ear. A few drops of warm olive-oil poured into the ear and allowed to remain for a short time may dislodge the foreign body and cause it to float to the surface. If the foreign body will not move with the ordinary gentle syringing, the doctor should be called in, as it is very dangerous for an unskilled person to use instruments in the ear.

Foreign Body in the Eye.—It is a very common thing for flies or small pieces of dust and grit to be blown into the eyes.

Treatment.—In some cases they can be removed by merely drawing the upper eyelid over the eye, or if it can be at all clearly seen it may be removed with the corner of a clean pocket-handkerchief. If a sharp substance has become embedded such as a piece of glass or steel, castor oil should be dropped into the eye and the doctor should be sent for immediately. Very often the eye becomes so inflamed that even after the foreign body has been removed the sufferer still feels great discomfort. (*See also* EYE.)

Foreign Body in the Gullet.—When a foreign body is swallowed and enters the gullet, which is the tube leading to the stomach, irritation and inflammation may be set up immediately, and a doctor must be called in; but usually he will have to send the patient to a specialist or a hospital for its removal by means of a special kind of tube.

Treatment.—In the case of a small fishbone or any small round object, there is a possibility of dislodging it and carrying it on to the stomach by eating large quantities of brown bread and drinking a quantity of lime juice. If the foreign body fails to become dislodged, it is advisable to seek the advice of a doctor as early as possible.

Foreign Bodies in the Stomach.—In many cases such things as swallowed coins, pins, etc., may reach the stomach and eventually reach the intestines without any treatment whatever.

Treatment.—It is not advisable to give medicines as these may do more harm than good, but a diet of lots of new bread and fresh vegetables may assist the foreign body in its passage through the bowels. The motions should be examined to make quite certain that the foreign body is expelled.

Foreign Bodies in the Wind-pipe or Lung.—These are sometimes inhaled when, for instance, a screw or a pin is held in the mouth and may either stick in the windpipe (trachea) or go down the bronchi into the lung. If a child gets an attack of coughing when playing on the floor, the possibility of such a foreign body must be remembered. Such foreign bodies as peas or beans are more serious than metal objects, as they set up a poisonous bronchitis, but all of them require the attention of a doctor and usually of a specialist. They are removed by an instrument called a bronchoscope, but first an X-ray examination must be done.

FORESKIN.—This is a fold of skin which covers the end of the penis. In some cases this foreskin is tight and cannot be rolled back as it normally should. In such cases circumcision or removal of the foreskin is generally advised. (*See also* CIRCUMCISION.)

FORMALDEHYDE.—Formaldehyde is a powerful antiseptic and disinfectant, but it is too irritating to be used on wounds and sores except in very weak solutions. There are many preparations of formaldehyde, but the best known one is formalin, which is used a great deal for preserving museum specimens and many other purposes. Formaldehyde is included in many popular tooth-pastes and mouth-washes and it acts as a deodorant, which means that it is capable of destroying unpleasant odours. Because of this it is made great use of in sick rooms and in hospitals, and it is also very valuable for

general household disinfection. One great point in its favour in this respect is that it does not destroy books or coloured materials and it is harmless to all metals except iron. To disinfect a room, the walls and furniture should be first sprayed with water, and paraform tablets (a preparation of formaldehyde) are then heated over a night-light or in a special vaporizer. If the room has been properly sealed up it will be found that the vapour from 25 tablets (25 grammes) will be quite sufficient to disinfect an ordinary sized room in about 10 hours. (*See also* ANTISEPTIC; DISINFECTION.)

FORMIC ACID.—Formic acid is found in the sting of bees and it is also present in the bodies of ants. A solution of this acid has been given inwardly in the treatment of muscular tremors and it has also been used for muscular rheumatism. The pure acid blisters the skin. (*See also* BLISTERING.)

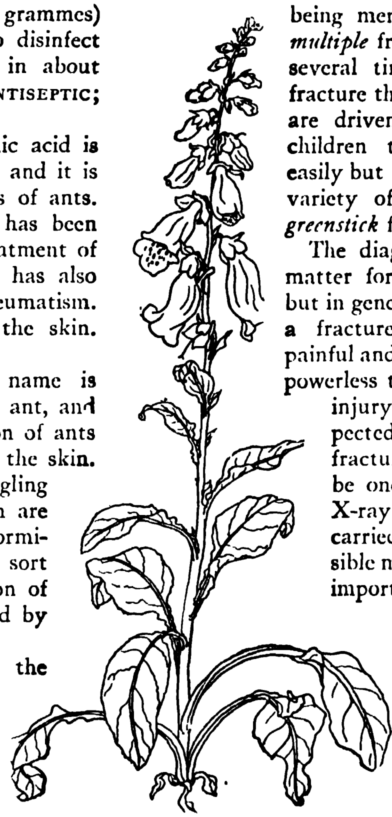
FORMICATION.—This name is derived from formica, an ant, and it is given to the sensation of ants walking and running over the skin. This feeling and other tingling sensations felt in the skin are known as *parœsthesias*. Formication is a symptom of one sort of neuritis, or inflammation of the nerves, which is caused by alcohol and other poisons.

FOSSA.—Derived from the Latin word fossa, a ditch, this term is used in connection with any depression or sunken part on the human body. There are many depressions and they each have their own particular name. For example, the antecubital fossa is the depression in front of the elbow and the cranial fossa is any one of the three depressions in the base of the skull which hold the iobes of the brain.

FOXGLOVE.—Digitalis, a drug used in the treatment of certain diseases of the heart, is obtained from the foxglove plant. (*See also* DIGITALIS.)

FRACTURES.—A fracture is the breaking of a bone, with or without damage to the surrounding tissues. Fractures are divided into various classes. If the bone is broken without any further damage it is called a *simple* fracture; if the skin is torn by the broken bone sticking through it, the fracture is a *compound* one; if the surrounding tissues and blood-vessels are also injured, it is known as a *complicated fracture*, and there may also be a *compound complicated* type. A *comminuted* fracture is one in which the bone is smashed and splintered instead of being merely broken across. In a *multiple* fracture, the bone is broken several times; and in an *impacted* fracture the broken ends of the bone are driven into one another. In children the bones do not snap easily but bend or splinter, and this variety of injury is known as a *greenstick* fracture.

The diagnosis of a fracture is a matter for medical care and skill, but in general it may be taken that a fractured limb is exceedingly painful and the patient is absolutely powerless to move the limb. Every injury where fracture is suspected should be treated as a fracture until it is proved not to be one, and in every case an X-ray examination should be carried out at the earliest possible moment. This is especially important where there may be a question of future "damages" or compensation.



Foxglove (*digitalis*)

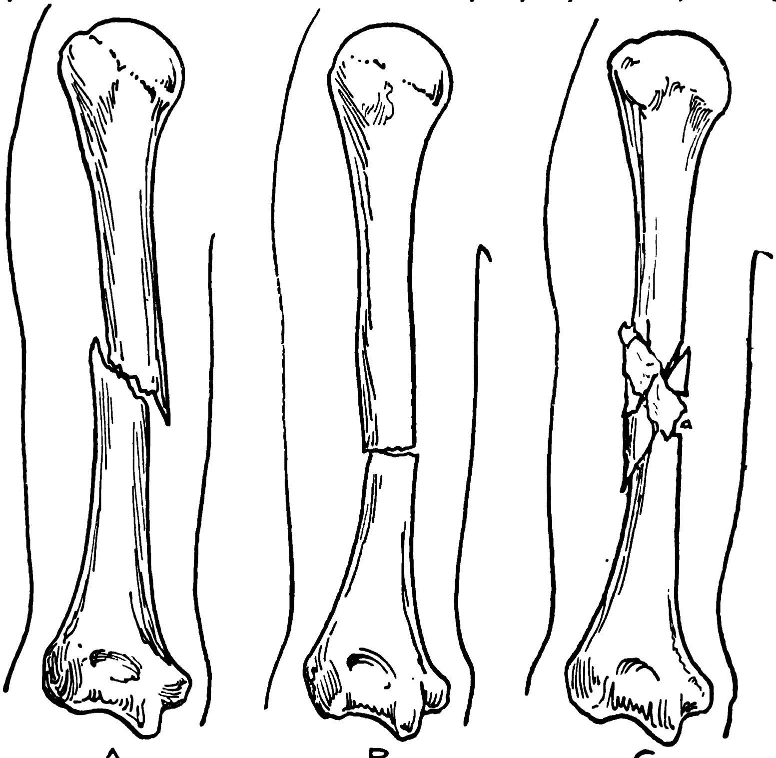
Treatment.—The first consideration in the treatment of fractures is to reset the bones back to a normal position. *In order to prevent any further damage, the patient must on no account be moved before the limb is secured in emergency splints of some kind.* Before applying the splint, the limb must be straightened; and if shortening has taken place, the limb should be pulled on with the greatest care and gentleness. There is great danger of a *compound* fracture becoming infected from contact with outside materials. The bleeding must be stopped as quickly as possible, and the wound washed and covered with a piece of lint or linen wrung out of a

dilute solution of carbolic acid. This dressing should be covered with a piece of oiled silk and the whole enveloped in a thick layer of cotton wool and fixed by a bandage. It is important that the splints should be long enough to extend to the joint above and the joint below the fracture, and they must be carefully padded so as to fit the limb accurately. Where there is a fracture of the spine, pelvis, or leg, the patient should never be moved unless on a stretcher, as a simple fracture may become compound unless handled very carefully. As there is always a certain amount of shock associated with fractures, the patient should be kept as warm as possible until the doctor arrives. Coverings of some sort should be provided, and, if possible, a hot drink of milk or broth should be given. (*See also* HÆMORRHAGE; and article on FRACTURES in SPECIAL FIRST AID SUPPLEMENT at end of book.)

FRAMBŒSIA.—A tropical disease (from French *framboise*—raspberry) known also as yaws and pian. (*See also* YAWS.)

FRECKLES.—Freckles consist of tiny accumulations of the colouring matter of the skin. They occur most commonly on the face, neck, and arms, and are most conspicuous in the summer. Fair and especially red-haired people are chiefly affected. They may be looked on as a natural protection against the sun's rays.

They may be *prevented* by avoiding direct sunlight. Gloves should be worn, and a veil, shady hat, or sunshade.



A B C

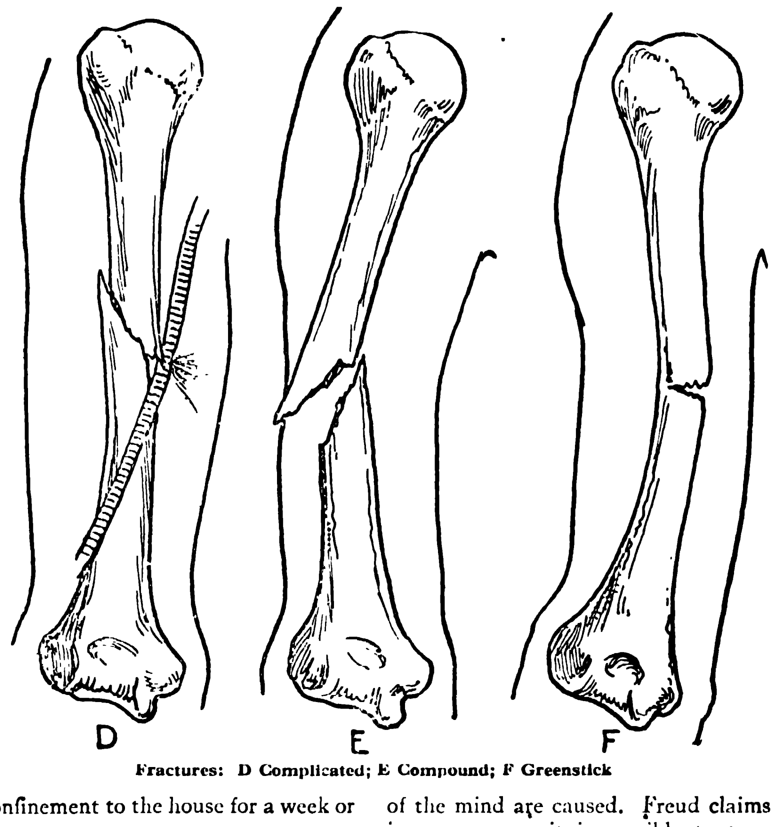
Fractures: A Simple Oblique; B Simple Transverse; C Comminuted

Treatment.—They may be *removed* by various applications. The mildest, which act by partially bleaching the skin, are butter-milk, sour milk, or lemon-juice. A more elegant preparation is lactic acid, 10 per cent. in rose-water. This is applied three times daily.

Stronger remedies, which act by causing a mild irritation and "peeling" of the skin—the freckles being shed at the same time—generally consist of corrosive sublimate. This is employed as a ½ or 1 per cent. solution in spirit, and painted on at night. If the skin

becomes red and sensitive, treatment should be discontinued for two or three days. After about fourteen days the freckles are very pale, but gradually regain their colour if treatment is discontinued.

For permanent removal, it is necessary to destroy the colour-producing cells by stronger applications or mechanical removal. These methods are more or less painful. and necessitate confinement to the house for a week or ten days.



Fractures: D Complicated; E Compound; F Greenstick

Some "freckles" are in reality small tumours. They do not fade during the winter. The widespread freckling sometimes seen in old people is of this variety. Treatment is seldom required.

FRENUM.—Frenum, or frenulum, is the term applied to any small fold of skin which restricts the movement of an organ of the body. The most common example is the short fold of mucous membrane which is found beneath the tongue. If this is unduly short, it may cause tongue-tie and the child may not be able to suck properly. A slight clipping of the frenum is all that is required to put matters right, but this should be done under proper medical care. Another fold of skin, or frenum, passes from the base of the thumb to the base of the first finger. (*See also* TONGUE.)

FREUDISM is the theory which has been devised by Professor Freud of Vienna to throw light upon the way in which disorders of the mind are caused. Freud claims that in many cases it is possible to trace the various steps by which a given cause gives rise to the symptoms of mental disorder, and by re-tracing these steps it is possible to cure the mental trouble. The method by which these steps are traced and re-traced is the often-quoted but seldom understood method of *psycho-analysis*. The main principles of Freudism are as follows: there are present in all of us, from infancy onwards, wishes and certain instincts. Many of these wishes and instincts have to be restrained by social laws and conventions. For example, the sight of a pearl necklace in a shop window

may arouse an impulse to possess it, but social laws and customs prevent us from obeying the impulse. But whenever there is opposition between these instincts and wishes and the social laws which prevent their fulfilment a *conflict* is said to be present. Briefly, the conflict is between pleasure impulses and social impulses. In the present state of our civilization the instinct with which our social impulses are most in conflict is the sexual instinct. Freud uses the word "sexual" in a very wide sense, not in the limited physical sense in which it is commonly understood.

Treatment.—These conflicts must be dealt with, and the process of dealing with them is called "resolving" them. The best method, and the one on which successful treatment depends, is by recognizing them as conflicts, meeting them and choosing the line of conduct to be followed. If this method were always possible and always taken, much nervous and mental trouble would be prevented; but many people do not recognize their mental conflicts and so cannot resolve them. The wish, which it is impossible to fulfil, is banished from consciousness and by becoming unconscious, forms part of the *unconscious mind.* The conflict is forgotten and cannot be recalled by any effort of the will, but it remains in the unconscious mind and influences thought and action. Such an unconscious wish is called a "complex" and the mental process by which it is banished from consciousness is called "repression." The way in which these unconscious wishes or "complexes" influence conscious thought and action depends on the particular mental make-up of the individual. Most complexes arise in early life, when the child first learns the lesson of what he may and may not do in civilized society.

The next best way of resolving them is by what Freud terms "sublimation," in which the primitive, repressed wishes are translated into a useful form of energy. Art, music, hobbies, are common examples of sublimations, which are of great social value. Most of the finest charitable work is done by those to whom such work is a sublimation; but only too often such a desirable result is not attained and the complex, with the unconscious wish seething underneath, is translated into a form of mental disorder. Anxiety, hysteria, and other nervous states are all the results of complexes which have not been allowed the social outlet of sublimation. It is the business of the psycho-analyst to discover these hidden complexes, and by enabling the patient to recognize their existence to get rid of them. Of great assistance in this connection is a discussion of the patient's dreams with his doctor, for during sleep, the repressions are weakened, and the unconscious wishes of the sleeper rise into consciousness as *dreams.* In the child, in whom repressions have not yet taken place, his dreams are a true reflection of his wishes; but in the adult, the repressions are still present during sleep, although much weakened, and so the dreams are distorted. But by discussing them with a doctor, the patients themselves manage to find out exactly what their dreams mean and how they are linked up with their mental troubles, and such an analysis of dreams forms one of the chief ways in which Freudism differs from other methods of treatment of mental disorder.

It must be emphasized that the patient himself reveals his repressions, by analysing his dreams himself. Much discredit has been brought on the method of treatment by psycho-analysis by folk who, themselves not trained in dealing with disorders of the mind, attempt to treat patients by what they call psycho-analysis. In true analysis nothing is suggested to the patient and he has, in fact, to work out his own salvation. The analyst is there only to point the way, not to lead him along it. Once the complexes have been recognized and faced, by the patient, the energy that was spent in repressing the complexes is available for use in more profitable directions, sublimation takes place and the neurosis, or hysteria, disappears. (*See also* DREAMS; PSYCHO-ANALYSIS).

FRIARS' BALSAM.—This is a popular name for the compound tincture of benzoin. It is chiefly used in hot water as an inhalant in cases of laryngitis, and it is excellent when used in a steam kettle for cases of croup, bronchitis, pneumonia and whooping-cough. About one drachm of Friars' balsam is sufficient for one pint of water. (*See also* BALSAM.)

FRICTION.—Friction, or rubbing, of the surface of the body is good for quickening the circulation of the blood and for toning

up the muscles. Friction is also used as a method of rubbing in oils or such like substances; this method of giving medicines is known as inunction. Friction can be applied to the body by massage in various ways or by baths and douches. (*See also* BATHS; DOUCHES; INUNCTION; MASSAGE.)

Friction Sounds.—These are sounds caused by the rubbing together of two surfaces of the body. Friction sounds may be heard when two joints move over one another, but the sound is specially heard over the chest in cases of dry pleurisy.

FRIEDREICH'S ATAXIA.—This is a disease of the nervous system which resembles disseminated sclerosis and locomotor ataxia, and like them, is due to a hardening of certain parts of the spinal cord and brain. It seems to affect young children and it is not unusual for several members of the same family to develop it. The chief symptoms are unsteadiness of gait which causes the patient to walk like a drunken man, and tremors of the arm and head. Later, the speech becomes slow and the eyes become affected. The feet become deformed and gradually complete paralysis may set in. The progress of the disease is very slow and may go on for as long as twenty or thirty years. No treatment is yet available for this condition.

FRONTAL SINUS.—The frontal air sinuses are hollows in the frontal bone of the skull connected with the nose and filled with air; their purpose is to give additional protection to the front part of the brain without adding to the thickness of the bone. Sometimes they are quite small and sometimes they are so large that they extend right across the eyebrows.

Treatment.—Influenza and other nasal infections may cause inflammation of the frontal sinuses and may require an operation. In acute inflammation, however, operation is not usually advised, but instead hot applications to the forehead are made, and menthol inhalations are employed (from a few crystals of menthol dissolved in boiling water), being used every two or three hours. Nasal douching does more harm than good in acute inflammation, but may be useful when the acute stage is passed. (*See also* INHALATION.)

FROST-BITE.—When the body has been in contact with very severe cold for any length of time, frost-bite may set in, and if the circulation is allowed to return too suddenly, the frost-bitten parts may become gangrenous, which means that they become dead. The parts of the body which seem to be attacked more than others are the fingers, the toes, the tip of the nose and the edges of the ears. These parts lie farthest away from the heart and in consequence the blood circulation is inclined to be poor. People who are in a low state of health are more inclined to suffer from frost-bite than normally healthy people, and very young children or very old people are also susceptible.

Symptoms.—After long exposure to cold the circulation may become very sluggish and parts of the body may turn white and waxy-looking. There may be no pain while this is going on so that a person is sometimes quite unaware of what is happening. Blisters usually form which may gradually develop into sluggish ulcers, and if the frost-bite is very severe the affected parts may turn gangrenous and die.

Treatment.—In the first place it must be mentioned that prevention is better than cure, and frost-bite may be prevented by carefully wrapping up while in intense cold, and by keeping the circulation going as much as possible by not sitting down. However, when a part of the body does become frost-bitten, the person should be kept away from all heat and the affected part should be rubbed with snow if at hand, and bathed in moderately cold water. It is important that the blood should not be allowed to get back into the frost-bitten parts too quickly as this will cause congestion of the part, and intense pain. Massage in the direction of the heart should be carried out as this will tend to keep down the congestion. If blisters appear they should be dressed with boracic ointment spread over lint and then a pad of cotton wool should be placed over them. The limbs should be raised as much as possible; the leg may be placed on a pillow and the arm should be raised in a sling. This will help to relieve any congestion and pain. If the parts are already gangrenous, they should be kept absolutely dry, dusted with boracic powder and wrapped up in cotton wool or soft flannel. At this stage it may be necessary to undergo a surgical operation.

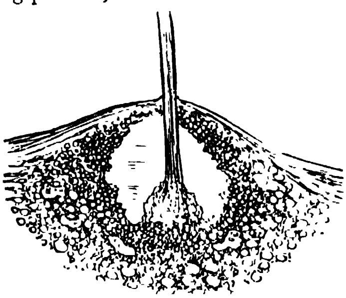
It must be remembered that the most important point in the treatment of frost-bite is to keep the patient away from heat as this

only makes the condition worse. (*See also* CHILBLAINS; GANGRENE.)

FRUIT LAXATIVE.—The majority of fruits have the effect of stimulating the action of the bowels but some are more effective than others. Figs, prunes, apples, etc., are very excellent for this purpose and are especially good for children.

FUCUS VESICULOSUS.—This is a sea-weed also known as bladder wrack, which grows round the coasts of Britain. It is particularly rich in iodine, bromine and chlorine. The manufacture of iodine from this sea-weed is quite an important industry, and a preparation is also manufactured which is used in the treatment of obesity. (*See also* IODINE.)

FULLER'S EARTH.—This is used as a dusting powder, but it should never be used



Furuncle or Boil (beginning at hair root)

on sores or raw wounds as it is an unsterilized earth or clay which contains aluminium silicate and it may contain undesirable germs. This powder gets its name from the fact that it was used to remove grease from cloth while it was being fulled or pressed in the mill.

FULLNESS.—Sufferers from indigestion often complain of a feeling of fullness which prevents them from eating a good meal. This is one of the most common symptoms of indigestion but it also may be due to other stomach disorders. (*See also* DUODENAL ULCER; GALL BLADDER; INDIGESTION.)

FUMIGATION.—When fumes or gases are given off from certain chemicals for the purpose of destroying germs, insects, rats, mice, etc., it is termed fumigation. The fumes given off by some chemicals may not be powerful enough to disinfect or destroy the germs of disease but they may be quite effective enough to kill rats and other pests. Hydrocyanic acid is used a great deal for killing these pests on ships, but it is not powerful enough to destroy germs. Formaldehyde is used a great deal for fumigation, and other substances are carbon monoxide, chlorine and sulphur. (*See also* DISINFECTION; FORMALDEHYDE.)

FUNCTIONAL DISEASE.—This is a vague term which one often hears, and it is generally applied to nervous disorders or disorders of the working of the body which are not directly due to diseases of the organs of the body. (*See also* DISEASE.)

FUNGUS.—One of the lowest orders of plants is known as fungus. The chief classes of fungi are the moulds, the yeasts, and the bacteria. Very often a spongy growth on the body is referred to as a fungus.

FUNNY BONE.—This is a popular term used in connection with the point of the elbow. There is quite a good supply of nerves reaching from the elbow down to the finger-tips, and whenever the funny bone is knocked, a tingling sensation may be felt down the arm to the end of the fingers, and to the tip of the little finger in particular. This tingling sensation is much the same as people feel in a limb that has been amputated when they complain of "feeling pain." (*See also* ELBOW.)

FUR DERMATITIS.—A skin rash may appear in the region of the neck due to wearing badly dyed furs. This form of dermatitis or inflammation of the skin, has become much more common within the last few years. (*See also* DERMATITIS.)

FURRED TONGUE.—A thin white layer on the tongue may be due to a disturbance of the digestive organs, or an attack of constipation; but on the other hand, some people seem always to have what is known as a furred tongue even though there may be no apparent reason for it. The "fur" generally consists of bacterial growth and particles of food. Sometimes drinking too much milk will cause the tongue to appear white and furred, or it may be due to too much smoking. (*See also* TONGUE, DISEASES OF.)

FURUNCULUS.—Furunculus is the medical name for a boil. (*See also* BOIL.)

FUSEL OIL.—Small quantities of fusel oil are present in all freshly distilled spirits, but the amount gradually lessens as the spirit matures. Its effect on the body is much more powerful, and indeed rather more poisonous, than ordinary alcohol and also lasts longer. (*See also* ALCOHOL.)

GAIT means the style or manner in which a person walks, and gives much valuable information about the illness from which a person may be suffering. The gait is especially important in cases of nervous disease; but it may be also an index of character. The man who slouches along with bent shoulders and head down, looking on the ground, is seldom one who is making a success of his life, whilst the man who "steps it out" gaily, with head erect and shoulders well pulled back is the man who is likely to get on in the world. The influence of gait on health is a subject on which much has been written. Here it is only possible to say that many minor ills such as indigestion, anæmia, palpitation and shortness of breath very often result from a faulty gait. If the shoulders are allowed to droop and the back is bent whilst walking, the lungs are unable to expand properly at each breath, with the result that insufficient air is taken in to supply the oxygen needs of the body, and a body starved of oxygen cannot be a healthy one.

The correct gait is one in which the body is held erect, the head neither upturned nor with the eyes fixed on the ground, the shoulders well pulled back to allow of expansion of the lungs, the arms swinging easily at the sides and the movement of walking from the hips, not from the knees. A faulty gait may be due to a number of different causes. In children such things as tuberculosis of the hip or knee joint, or St. Vitus's dance or acute rheumatism are to be thought of when a child for no obvious reason begins to walk in an unusual way. It is important that any child who develops a curious gait should be examined by a doctor, because in the early stages of such disorders as are given above the disease is curable; later on cure may be impossible. In adults, injuries to, or diseases of, the hip joint, such as rheumatoid arthritis, may cause the gait to be altered, but the most strikingly abnormal gaits are seen in certain diseases of the nervous system.

In *disseminated sclerosis* the gait is of the "sticky" or "spastic" type; the patient has difficulty in bending the knees and drags his feet along, the toes scraping the ground at every step. The legs are moved "all of a piece" and are swung forwards, rather than raised from the ground. In people who have had a stroke and recovered, the same type of gait is seen, but in one leg only, as only one side of the brain has been damaged. The "ataxic" or "stamping" gait is best seen in people who are suffering from *locomotor ataxia* in its late stages. The patient raises his feet very suddenly, often higher than usual, and then jerks them forward, bringing them to the ground again with a stamp. He is also not quite sure of where he is going to place his feet, and waves them about in the air, as it were, before putting them down, looking at his feet all this time. The "reeling" gait is often mistaken for a drunken gait, and therefore requires no other description. The unfortunate patient reels from side to side, and often falls to one side or the other. This type of gait occurs only in patients who are suffering from disease of that part of the brain which controls balance, that is, the little brain, or cerebellum. In inflammation of the nerves of the legs, such as occurs sometimes in lead poisoning or in poisoning by alcohol, the gait is what is described as "high-stepping," the advancing foot hanging with the toes pointing towards the ground, the leg being lifted high so that the toes may clear the ground. (*See also* Disseminated Sclerosis; Locomotor Ataxia.)

GALANGAL.—Galangal is a drug which is sometimes used in the treatment of flatulence, and powdered galangal may be used as a snuff in nasal catarrh. There are two distinct types of this drug; one is imported from China and is called the lesser galangal, while the other is termed the greater galangal and comes from Java.

GALBANUM.—This is a drug which is useful in cases of bronchitis. It is very often used in the form of a plaster in order to reduce inflamed swellings. It has a very unpleasant smell and taste.

GALL.—Gall or nut-gall is the name given to a round growth which often appears on oak trees. It is caused by the little gall wasp when laying its eggs. These growths or galls, contain a large percentage of tannic and gallic acids and preparations from them are used a great deal in medicine because tannic is a powerful astringent, which means that it is capable of contracting the tissues and preventing bleeding. Ointment made from galls is used in the treatment of piles.

The term gall is sometimes used in connection with bile. Gall is extremely bitter to the taste, hence the expression "bitter as gall."

GALL-BLADDER.—The gall-bladder is commonly described as a pear-shaped vessel, because its shape does in fact resemble that of a pear, being broader at one end and tapering towards the other. It serves as a store for some of the bile from the liver. This bile is a very important digestive substance which is manufactured in the liver and pours from it by way of the hepatic duct, gall-bladder and common bile duct into the duodenum. Some of the bile from the liver trickles directly from the hepatic duct, which is the passage leading from the liver into the common bile duct—the passage from the hepatic duct and the gall-bladder to the duodenum—but most of it enters the gall-bladder where it is concentrated by having water removed from it, and sent on to the duodenum. The signal for the gall-bladder to begin pouring out its concentrated bile into the duodenum is the entry of the meal, eaten twenty minutes or so before, into the duodenum from the stomach. This food is mixed with the digestive juices from the stomach and when this acid mixture passes into the duodenum which is normally alkaline, the effect is to bring the bile from the gall-bladder and liver to mix with it. (*See also* BILE; DIGESTION.)

Gall-bladder, Diseases of.— The gall-bladder is very liable to suffer from catarrh, from inflammation (cholecystitis) and from stones (cholelithiasis).

Catarrh and Inflammation of the Gall-bladder.—Catarrh of the gall-bladder is fairly frequent in middle-aged persons who do not lead an active enough life and eat too much food of the stodgy starchy type. It is commoner in women than in men and especially in the "fair, fat and forty" type. It is due to infection by various germs which have found their way, either directly from the bowels, or by way of the blood-stream from some distant seat of infection such as diseased teeth or tonsils. The germs which are most frequently found in the gall-bladder are those which normally live in the intestine where they do no harm, such as the bacillus coli. It is a peculiarity of the gall-bladder that the germs of typhoid fever will linger there for many years after a person has had an attack of typhoid fever. A catarrhal state of the gall-bladder if left untreated leads in many cases to the formation of gall-stones and to inflammation.

Symptoms.—Where catarrh or inflammation of the gall-bladder is present there is always a certain amount of discomfort after food. The stomach feels overloaded and there may be a definite disinclination to eat. A feeling of weight may be felt in the right side of the abdomen and pain which may be general over the right side or felt in the region just below the ribs to the right of the navel. An aching pain under the right shoulder may also be felt. Constipation is also present and there may be a slight degree of jaundice shown by a sallow skin and yellowing of the whites of the eyes. At intervals the condition will probably become acute, and there will then be a rise in temperature with cold shivers down the spine, and a more severe pain in the region of the gall-bladder. This pain may be a steady ache or may shoot all over the abdomen and through to the back. Vomiting and nausea may be very bad.

Treatment.—If gall-bladder trouble is left untreated it usually becomes gradually worse until gall-stones form and an operation may be required. Even if the complaint is not very bad it will mean persistent ill-health and a chronic feeling of being below par. Women with gall-bladder catarrh usually make their condition worse by putting on flesh, which again makes it even more difficult to obtain the necessary amount of exercise to keep the bile circulating. The first step in the treatment must be to seek out any septic focus in the body. The teeth, nose and throat must be inspected and any gynæcological conditions in women should be attended to. The diet should be light and as scanty as possible, with little fat and carbohydrate in it. More exercise should be arranged for, especially if most of the day is taken up in sedentary occupations. The increase in dancing, skating, swimming, etc., of late years has been a great boon to many people, by enabling them to "shake up their livers" in pleasant surroundings after the day's work.

The drug which is most useful for disinfecting the bile is hexamine. This should be taken with alternate doses of some alkali to counteract the irritating effect it has on

the kidneys and bladder. A dose of calomel at night is a great help to some people. Epsom and Glauber salts in equal parts in the morning help to clear out the gall-bladder. If the condition gets worse and the person becomes seriously ill it may be necessary for the doctor to drain the gall-bladder by either surgical or non-surgical means.

GALL-STONES.—Gall-stones frequently form in the gall-bladder when it has suffered from catarrh for some time. Often they are present without causing any symptoms or only the symptoms of a slight catarrh, but the moment may arise when a stone becomes dislodged from the gall-bladder and begins to pass down the bile duct, on its way to the intestines. This gives rise to the condition commonly referred to as "an attack of gall-stones." Intense pain is felt, which may be so bad that the patient actually rolls about the floor or bed in agony. This is called *biliary colic.* There is often vomiting and sweating. When an attack begins the patient should be put in a hot bath. This will often be sufficient to ease the pain, but in more severe cases it may be necessary for the doctor to give morphia or a whiff of chloroform. Atropine sulphate is very useful in controlling the attacks.

Treatment.—Once gall-stones have developed there is no known method of dissolving them. Some people take large doses of olive-oil under the impression that they are dissolving their gall-stones, and unscrupulous persons even undertake to treat sufferers from gall-stones by giving them something to make them sick and claiming that they have vomited up the gall-stone. Both ideas are impossible. Once the attack is over the condition must be treated medically for chronic gall-bladder catarrh or more probably surgically by the removal of the gall-stones and usually at the same time the gall-bladder.

GALVANIC BELT.—This is a belt which, when worn next to the skin, is supposed to be able to cure many aches and pains. It is made of cloth on which are arranged metal discs of zinc and copper. The moisture from the body is supposed to set up a current, or the current may be supplied from a small battery. Any benefit is more probably mental than physical.

GALVANISM.—What is known as the galvanic current is made use of in medicine for the treatment of various conditions such as muscular rheumatism, etc. (*See also* ELECTRICITY.)

GALVANO-CAUTERY.—This is an electrical method used in surgery for the destruction of small growths or to shrink swollen tissues. (*See also* ELECTRICITY.)

GAMGEE TISSUE.—This is a surgical dressing made of cotton wool which has thin gauze on each side of it, called after a once famous Birmingham surgeon. (*See also* COTTON WOOL.)

GANGLION.—A ganglion is a misleading term in that it is used for two separate conditions which have nothing to do with each other. The more important meaning of ganglion is a collection of nerve cells into which other nerves run and where they join together. If the nervous system of the body is compared to a railway, the ganglions are the large railway junctions—not stations—where various lines meet together from all over the country and from which they continue on their way. The largest ganglion in the body is the *solar plexus,* which is situated in the middle line of the body above the navel. It is well known from the experience of boxers and others how a blow on this important junction of the nerves of the abdomen will completely knock a person out for a time. Another important ganglion is the *gasserian ganglion,* lying between the temple bone and the ear. The trigeminal or fifth nerve, which supplies the face and is so often the seat of facial neuralgia, passes through this ganglion.

The other meaning of ganglion is a small cyst or swelling in the sheath of a tendon which contains fluid. These ganglia are fairly common at the back of the wrist. They are small, painless, and of no serious importance. Sometimes they disappear of their own accord, but if they do not do so the favourite treatment for them is to strike them hard with a book or give them a hard knock against a flat object. This will burst the swelling and disperse the fluid. The cyst will usually fill up again, however, and may have to be dissected out if it is troublesome. (*See also* GASSERIAN GANGLION.)

GANGRENE.—Gangrene, or mortification, is the term used when a part of the body, usually a limb, loses all vitality and becomes dead. There are two types of this condition, "dry" and "moist." In the dry type, the

dead part shrivels up, and becomes hard, dry and wrinkled, and of a dark brown colour; while in moist gangrene the part becomes inflamed and swollen and putrefaction sets in.

Gangrene may be due to several causes, and there are certain diseases which lower the vitality of the body and make it more liable to occur. Diabetes and the disorder of the kidneys known as Bright's disease are among the chief of these. Any interference with the blood supply to a part of the body will cause that part of the body to die, and this very often happens if the main arteries have been cut or torn away as the result of an accident. Frost-bite, also, may result in dry gangrene if it has been severe. In elderly people with diseased arteries, or in *Raynaud's disease* in which the arteries are affected, or after poisoning by ergot which causes constriction of the arteries, gangrene is very liable to set in.

Symptoms in Dry Gangrene.—In elderly persons with diseased arteries there may be some pain in the affected limb before gangrene actually sets in. There is no pain as a rule after gangrene has occurred and there is very rarely any fever. The gangrenous part becomes separated from the normal tissues by what is known as the line of demarcation. This line is very sharply marked by a red ring of inflammation on the healthy side. This ring gradually deepens in colour, until after a month or two, the gangrenous part may drop off and leave a stump.

Symptoms in Moist Gangrene.—Of the two, moist gangrene is the most dangerous and, unfortunately, the most common. The part becomes swollen, and is usually greatly discoloured. There are numerous blisters containing fluid on the gangrenous part and these ooze all the time and are very foul smelling. The patient is usually in a high state of fever, and often delirious, and death may result from general blood-poisoning in a few days. There is no sharply-defined line of the gangrenous area, and the gangrene is apt to extend up the limb.

Treatment.—Treatment of dry gangrene consists, in the first instance, of measures to prevent the part from undergoing putrefaction, or, in other words, from developing into moist gangrene. Moist dressings should never be used and dry antiseptic powder must be used in their place. When the red line appears, amputation may be performed close above it. In the moist form of gangrene boric acid and other antiseptic dressings should be applied at frequent intervals in order to keep the gangrene as dry as possible, but in rapidly spreading cases, amputation may have to be carried out at an early date. If amputation is to be successful, it must be performed high up on the limb, so as to get well beyond the infected part, otherwise a second operation may have to be performed later. Every possible care must be taken to build up the strength with nutritious food and careful nursing.

GARGLE.—A gargle is a watery solution which is used to cleanse the back of the throat. There are many drugs which may be used for this purpose but it is always advisable to use only those which can be swallowed without any unpleasant effects. A teaspoonful of common salt along with one of baking soda in a tumblerful of warm water is a very useful and handy gargle. This will help to clear the throat of any material which cannot be removed by coughing. Another common gargle is a tablet of chlorate of potash dissolved in a wineglass of warm water.

If the throat is slightly irritated or relaxed, alum is a substance frequently used. About 10 grains in half a glass of warm water will be found very soothing. Antiseptic gargles should be used if the throat is at all infected, or in cases of tonsillitis or bad breath. Permanganate of potassium used in a faint pink solution is one of the most common gargles. Usually one or two crystals will be found sufficient to colour the water.

How to Gargle.—About a tablespoonful of the solution should be taken into the mouth at one time after a deep breath has been taken. The head should be thrown well back and the solution should be made to bubble at the back of the throat. This will ensure the whole of the throat being sprayed, and will also prevent any of the solution from being swallowed. The breath should be held as long as possible in order to obtain the most benefit from the gargle.

GAS POISONING.—There are many trades in which gas poisoning may occur owing to the fumes given off in the manufacture of certain materials. In the case of miners, there is always an element of danger from carbon monoxide which is found in coal gas. Other examples of gas which may produce poisoning include the fumes from mercury,

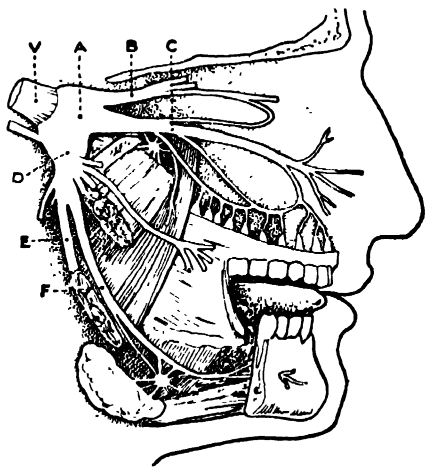
arsenic, lead and phosphorus. During the Great War, gases were made use of which caused enormous numbers of casualties. There were many types of gases used, but the most common ones included "mustard" gas, chlorine, phosgene, and hydrocyanic acid. For treatment of poisoning *see also* CARBON MONOXIDE.

GASSERIAN GANGLION.—The gasserian ganglion is the collection of nerve cells where the various branches of the trigeminal or fifth cranial nerve meet. It is situated on the side of the head between the ear and the temple bone. The trigeminal nerve supplies the skin of the face and the muscles which are used in the act of eating. This fifth nerve is the nerve which is so often involved in facial neuralgia. Facial neuralgia is sometimes a very intractable and extremely painful complaint and to ease pain which may have made a person's life miserable for years an operation has been devised by which the gasserian ganglion is entirely removed. (*See also* FACIAL NEURALGIA; TIC DOULOUREUX.)

GASTRIC FEVER.—This is an old term for typhoid fever and is never used nowadays.

GASTRIC or STOMACH ULCER.—A gastric ulcer is an ulcer in the stomach. Gastric ulcers are also called *peptic ulcers.* in common with other ulcers which are situated in the stomach or duodenum. A stomach ulcer may be either acute or chronic, and may occur in either men or women at any age, though acute ulcerated stomachs are more common in young women than in any other class of people. Chronic ulcers of the stomach are commoner in men but are also found frequently in older women. It is not known exactly what causes gastric ulcers, but the ulcers always occur in situations where they are exposed to the action of the gastric juices so they may have something to do with them, especially as ulcers appear to be more common in people who have a good flow of gastric juice. Young nervous people seem liable to develop ulcers, and the typical case is one in which a young anæmic girl suddenly has an attack of bleeding from the stomach without any definite symptoms beforehand.

Symptoms.—In young persons the first warning that an ulcer has developed may be the vomiting up of blood from the stomach (hæmatemesis), an occurrence which is much more alarming than the condition warrants because these acute ulcers in young people are usually cured without much difficulty, whereas an ulcer in an older person may be a much more serious matter. There may have been preceding attacks of indigestion, pain after food, loss of appetite caused by the dread of the pain which the taking of food causes. In many cases there is vomiting of blood; but blood may be found in the stools, which become darkened in colour as a result, a condition which is known as melæna. If there is any doubt about the



Gasserian Ganglion:
A Gasserian Ganglion D Mandibular Nerve
B Ophthalmic Nerve E Lingual Nerve
C Maxillary Nerve F Inferior Alveolar Nerve
V Fifth Nerve

presence of an ulcer an X-ray examination by means of a barium meal will usually settle the question.

Treatment.—The first essential in the treatment of peptic ulcers is rest both for the body, in order that it may use all its available strength for healing purposes, and for the stomach, so that it will not be irritated more than necessary by having to deal with irritating substances in the way of food passing over the sore and ulcerated spot in its lining. To procure the necessary rest the patient is put entirely in bed for from three weeks to six weeks, and then is only allowed to take up a strenuous life again by degrees, whilst treatment by dieting, etc., must be carried out for some months longer.

Diet is of the greatest importance in treating gastric ulcers. The diet which is

almost universally used is called the Sippy diet, and is given in detail in the SUPPLEMENT ON DIET. The Sippy diet, or a modification of it, must be followed until there is no trace of blood in the stools and no more pain is felt; milk is the most important item in the diet. Bicarbonate of soda, once a great stand-by, is now no longer recommended, but magnesia is a good substitute for it, and medicine containing atropine or belladonna is usually prescribed. Of course, any bad teeth must be attended to and any unhealthy condition in the nose or throat. (*See also* STOMACH, DISEASES OF.)

Bleeding from the Stomach (Hæmatemesis). **Treatment.**—When this occurs suddenly put the patient lying flat, in bed if possible, and keep as quiet and motionless as possible. When the doctor arrives, he usually makes sure that the patient will remain still by giving an injection of morphia. Nothing must be given by the mouth until the bleeding has stopped, but if necessary the patient may be nourished by rectal injections. A simple enema will clean out the bowel, and then an injection of the salt solution called *normal saline* to which glucose has been added may be given. The mouth may be sponged out at frequent intervals with cold water, but this should not be swallowed.

GASTRITIS.—Inflammation of the lining of the stomach is known as gastritis, and there are two stages of this condition, the acute and the chronic. The acute form usually develops as a result of taking some indigestible or some tainted food, or from drinking excessive amounts of alcohol. It may occur in influenza, bronchitis, pneumonia, or at the beginning of an infectious fever. In children, acute gastritis is usually present in summer diarrhœa.

Symptoms of Acute Gastritis.—At the beginning of a mild attack there may be a feeling of heaviness in the region of the stomach and the tongue may be thickly coated with fur. A feeling of sickness comes on which is relieved when vomiting takes place. There may be no sign of any rise of temperature and the attack may not last longer than from 24 to 48 hours. In the more severe forms of acute gastritis however, these symptoms become more definite, and there may be a rise in temperature to as much as 103°F. Instead of vomiting the usual stomach contents there may be a large quantity of mucus, gastric juice, and possibly some blood. The patient may suffer from collapse and faintness which may last for four or five days.

In the majority of cases, an attack of acute gastritis lasts only a short time, and apart from diarrhœa, there are rarely any complications; but in severe cases, the acute form may develop into the chronic condition, and in rare cases, ulceration of the stomach may occur.

Treatment of an Acute Attack.—The patient should be put to bed and kept warm with hot-water bottles. It is necessary to clear the stomach of any irritating substance, and this may be done by encouraging vomiting. Drinks of warm water may be given for this purpose, and if vomiting is delayed, a simple emetic consisting of a tablespoonful of mustard in a glass of warm water may help matters considerably. Two grains of calomel or a good dose of castor oil will clear out the bowel, especially if it is followed by a dose of salts in the morning. Calomel should never be given to children, as it may prove too strong for them; but castor oil will be found sufficiently powerful.

No food should be given, and even after the vomiting has ceased it is better to give nothing but soda water for a time. Should vomiting still persist after the stomach has been cleared, attempts to stop it may be made by giving sips of hot water. To relieve the pain in the stomach, hot flannels or a mustard leaf may be applied to the abdomen and sips of peppermint or ginger water may be taken. If the condition does not clear up after the bowels have moved, or if the patient appears really ill, send for a doctor without further delay. For the treatment of Chronic Gastritis *see also* INDIGESTION.

GASTRODYNIA.—Intense pain in the stomach is sometimes referred to as gastrodynia or gastralgia. (*See also* INDIGESTION.)

GASTRO-ENTERITIS.—Inflammation of the stomach and intestines, the main symptoms of which are vomiting, diarrhœa and general weakness. (*See also* DIARRHŒA.)

GATHERING.—This is a popular term applied to a boil or abscess when it comes to a head.

GAULTHERIA.—Gaultheria, or wintergreen, is an American evergreen plant containing an oil with a very fragrant smell.

More than 90 per cent. of the oil is methyl salicylate, which is useful in the treatment of rheumatism and sciatica. Mixed with olive-oil, it may be rubbed on the skin to relieve the pains in rheumatism or lumbago.

GAUZE.—Gauze is a thin open-meshed cloth used for surgical dressings. When it has been treated with antiseptics it is referred to as antiseptic gauze. It is called gauze because it was first imported from Gaza in Syria.

GAVAGE.—When a person is unable to swallow and feeding must be carried out by means of a stomach tube, this forced feeding is called gavage. By this means liquid food such as strong soups, beaten-up eggs or milk can be given. (*See also* FORCIBLE FEEDING.)

GELATIN.—Gelatin is a substance which is obtained by boiling down animal tissue, bone, gristle and cartilage. It forms a colourless substance which is jelly-like when moistened, and hard and brittle when dried. It is used a great deal as a food and also in the making of pastilles, jujubes and various other chemical things. Gelatin capsules are made to hold unpleasant drugs, and gelatin of zinc is sometimes poured over ulcers in order to protect them when healing. Solutions of sterile gelatin have been injected into the body in order to raise the blood-pressure after severe hæmorrhage, and it is also capable of forming clots in the blood which is useful in the treatment of aneurysms.

GELSEMIUM.—This is the root of the yellow jasmine which grows in America. It is used in the treatment of neuralgia, rheumatism and headache, but it should be used with care because in large doses it produces symptoms of poisoning. It was omitted from the new edition of the British Pharmacopœia on the ground that other drugs were more useful for the same purposes; but many doctors think that this was a mistake and find it useful.

GENERAL PARALYSIS OF THE INSANE.—This is a disease which until lately was rightly looked upon as one of the most fatal, as well as the most horrible, diseases of the nervous system. But during the last ten years a new treatment, which will be described later, has so changed the outlook for the unfortunate sufferers from this disorder, that it is safe to say that in cases in which the disease is recognized early enough, at least one-third, and probably even more, of the cases can be so far cured in that the patients can return to their ordinary work, whilst a large number, though not curable to that extent are able to live happy, useful lives instead of dying in misery a few years after the onset of the disease, which was the only outlook for them a few years ago. But everything depends on the disease being recognized in its early stages, and only too often it is found that cure is impossible because the disease has destroyed too many of the essential nerve cells in the brain for a true recovery to take place.

It is possible for a doctor to discover (by an examination of the patient and of the fluid which is obtained by putting a needle in between the bones of the back and drawing off the fluid present in the space between the coverings of the spinal cord) whether a patient has G.P.I. very early after the appearance of any symptoms whatsoever, and often before any symptoms have shown themselves, whilst the patient is merely feeling "run down" and "nervy."

It has now been proved beyond all doubt that G.P.I. is always caused by syphilis. The germ which causes syphilis can be seen in the brains of those who have died from G.P.I., and the special test for syphilis can always be found positive in the blood and spinal fluid of patients with G.P.I. The germ in the brain manufactures poisons which destroy the delicate nerve cells, and as it is the most fragile nerve cells which control our intellect, it is not surprising that mental changes are noticed fairly early in the disorder. In an attempt to combat the poisons which are being thrown out by these germs in the brain, the brain tissue tries to strangle the germs by enveloping them in a new firm tissue, like delicate threads of silk; but unfortunately, as well as strangling the germs, the firm tissue also destroys the nerve cells, and so more nerve cells are killed off, thus further diminishing the number available for the patient to think with. The new treatment of G.P.I., by producing a very high temperature, kills off the germs in the brain so that they are unable any longer to produce poisons, and thereafter, as the need for the tissues to strangle the germs exists no longer, no fresh firm tissue is formed in the brain and that already present disappears in the course of time. But once nerve

cells are killed they can never re-form, and so it can plainly be seen that the necessity for beginning treatment whilst as few nerve cells as possible have been damaged is vital for the cure of the condition.

G.P.I. occurs all over the world and no class or race is exempt. The infection with syphilis takes place sometimes many years before the nervous disease develops. On an average, G.P.I. occurs ten to fifteen years after the infection has taken place. It is especially likely to occur in patients in whom the syphilis has been badly or insufficiently tr ated. It is much more common in men than in women.

Symptoms.—The first sign of the disease noticed by the relatives and friends of a patient suffering from G.P.I. is a change in his character. The affectionate husband becomes morose, depressed and neglectful, both of his own interest and of his wife. He often feels a lack of self-confidence and an apathy which is too often put down to "nerves" by his friends until more obvious changes in his personality appear. These may take one of two forms. Either the patient becomes more and more depressed, ceasing to take any interest in his hobbies and his surroundings, and obviously shows that he is incapable of work, then allowing his friends to persuade him to see a doctor, or he becomes more cheerful and lively, full of plans for doing impossible things, belittling his friends' evidence that he is "not himself" and ready with ridiculous excuses to account for his bad work and failing memory.

The latter type is much less likely to escape examination by a doctor, since the most fantastic ideas of wealth and prosperity may be possessed by an unfortunate patient with G.P.I. who has in reality "not a penny to bless himself with." Such patients will make the most absurd statements, which are to them perfectly reasonable. Thus, a man will say he possesses twenty million pounds sterling, but in the next breath will beg the doctor to give him a cigarette as he cannot afford to buy one. Or the man who claims to be the champion boxer of England will be unable even to assume a fighting attitude. But these false beliefs of wealth and fame are not so frequently met with nowadays as the depressed type of case, and it is certainly a common and sometimes excusable mistake for G.P.I. to be taken for simple neurasthenia in its early stages. The middle-aged man who becomes inattentive to his business or careless in his work, irritable, complaining of vague headache and sleeplessness is often judged to be suffering from over-work and sent for a holiday.

But certain physical accompaniments may make such a case suspect: any kind of attack, such as an epileptic fit, in a person who has not before suffered from epilepsy is suggestive of some real disease of the brain which may be G.P.I. Vision may sometimes be affected, the patient either seeing two objects instead of one for a considerable time, or he may show an obvious and not previously noticed squint. Sometimes slight seizures may occur, leaving the patient more or less paralysed down one side and the speech may alter, giving a curious slurring effect which is quite characteristic to the trained ear. This speech is a difficult one to describe: the patient finds it hard to say his words; he halts and stumbles over long words and may leave out, slur over or say twice parts of them. The writing suffers somewhat in the same way; the former character of the writing is lost and it becomes tremulous, whilst there is a tendency to omit words or syllables. Physically, going downhill rapidly, mentally, unfit to take charge of his affairs, the plight of the patient with G.P.I. is a pathetic one. Before the introduction of the present treatment, a year or two at home, taxing the patience and forbearance of his family, then six months or a year in a mental hospital as a wreck of his former self, saw the end of such a patient. It was indicated that that new treatment has revolutionized his position.

Treatment.—This treatment consists in deliberately giving the patient malaria, either by letting the mosquito which carries malaria bite the patient, or by injecting into his blood the blood of another patient who has malaria. The necessary malarial mosquitoes can be obtained by a doctor from the Ministry of Health. It seems a strange thing to do to give a patient one disease to cure another more deadly one; but although malaria, as seen in tropical countries, is a very dangerous disease, there are several forms of it and the form that is given to patients suffering from G.P.I. is a relatively mild one, which can be controlled and cured at any desired moment by a known remedy,

quinine. The effect of giving malaria in G.P.I. is to produce very high temperatures in the patient's body at regular intervals, either every day, every other day or every three days, for a certain period, depending on the general health of the patient and his response to the treatment. These high temperatures kill off all, or nearly all, of the germs in the brain which are causing the disease and the patient is left, after his course of malaria, weak but much improved mentally. The improvement continues for several months, and is helped by what is called "after-treatment" with various drugs, of which arsenic, bismuth and mercury are the most commonly used. Sometimes it is considered necessary to give further injections of malaria after a suitable interval, and the prospects of cure are now so hopeful with this treatment that every patient who has improved under malarial treatment should be urged to undergo it again if the doctor thinks it wise.

A few cases are found which do not respond to malaria, that is, the patients do not get the high temperatures necessary to kill off the germs, and various other ways of raising the temperature have been tried, such as prolonged hot baths and injection of various drugs, but so far, the production of high temperatures with malaria has been the most successful measure in combating the effects of this terribly fatal disease. It must once again be emphasized that the early recognition of the disorder is all important for the success of the treatment. In advanced cases, the most that can be hoped for by any method of treatment is that the patient's life is prolonged for a few years; complete cure depends entirely on how early the case is taken in hand. (*See also* MALARIA.)

GENITALS.—The genitals are the organs of reproduction. (*See also* REPRODUCTIVE SYSTEM.)

GENTIAN.—This is a bitter substance much used to improve the appetite and prevent indigestion, and a favourite flavouring for tonics and other medicines. (*See also* BITTERS.)

GERM.—The word germ is used in two senses, first to signify any of the bacteria or microbes. In this sense it is treated under the heading GERMS. Secondly, the germ of a thing means the small kernel or nucleus which is the part of any living organism from which a similar new organism springs. We speak of the germ of a grain, but the nucleus of a cell is a germ and so is the embryo of a human being.

GERMAN MEASLES.—German measles is a mild infectious disease occurring chiefly in children usually after the age of 5 years. It takes about 15 or 16 days to develop and the child is not allowed to return to school for 10 days after the appearance of the rash, or 21 days from the date of exposure to infection.

Symptoms.—The child seems slightly out of sorts and develops a temperature accompanied by a slight cold, a chain of enlarged glands which feel like hard peas down the sides of the neck, and a rash which is a cross between the scarlet fever and measles rashes. The rash comes out first on the face and spreads over the body, arms and legs. It is widespread and has a red measly appearance; it has often completely vanished in 24 hours' time.

Treatment.—The treatment is simple, as the disease is not as serious as ordinary measles. The child should be kept warm in bed, and the bowels kept open with syrup of figs or milk of magnesia. The diet should consist of milk and milk puddings, such as cornflour, semolina, ground rice, Benger's food, etc. Beef-tea, fruit and any amount of water, lemonade and barley water may be given. When the temperature has returned to normal, in a day or two, and the rash has disappeared, the child will be allowed up, but should be kept isolated in the bedroom for one week after the appearance of the rash. All the usual precautions should be taken against spreading the disease, such as spreading a sheet soaked in disinfectants over the outside of the door, wearing an overall in the room, disinfecting the hands, and keeping all dishes and linens separate. No visitors or animals are to be allowed in the room. Although the disease is usually slight, it is necessary to send for the doctor when the rash appears, as it is extremely difficult sometimes to be certain that the rash is not that of scarlet fever, which is a very serious illness on account of its complications. German measles itself is a disease which usually causes no complications and is most unlikely to result in death.

GERMICIDE.—Any substance which is capable of destroying germs is called a

germicide. Prolonged and intense heat acts as a germicide as well as many drugs. (*See also* ANTISEPTIC; DISINFECTANT; GERMS.)

GERMS.—Under the heading germs are included microbes, also bacilli, bacteria, yeasts—in fact, all the little living micro-organisms which cause disease in our bodies when they are growing out of place in it and in excessive numbers. Many germs, however, have their definite use in some particular part of the body such as the *bacillus coli*, the germ which lives normally in the colon where it helps to break up the unwanted waste materials of food in order that they may pass on and be voided. This bacillus is useful and normal in its proper place in the lower bowel and in the appropriate numbers, but when it strays into other regions such as the upper bowel and gall-bladder it becomes a source of ill-health.

Germs are the simplest form of life. They are very minute and cannot be seen without the aid of a microscope. Each germ consists of a single cell with a nucleus. It spreads and multiplies by the division of the cell and nucleus, as is explained in the article on CELLS. Some germs have no power of movement of their own, and are simply carried about in the fluids of the body, but others can move of their own accord.

The main classes of germs are the *cocci* or spherical germs, the *bacilli* or rod-shaped germs, and twisted shapes called *spirilla.* The *cocci*, the germs of which most is heard, are the *cocci* in the form of *streptococci*, *staphylococci*, and *pneumococci*. These cocci are the shape of a sphere when they are looked at singly, but they are more often seen in groups or strings with their sides flattened against their neighbours. The illustration commonly used to give some idea of their size is that a drop of water would contain at least 1,000 millions. The pneumococcus is the germ which causes pneumonia, the staphylococcus is the cause of boils and other skin troubles, and the streptococcus causes tonsillitis, scarlet fever, erysipelas, and various other acute infections.

Such various forms of disease as anthrax, botulism, colitis, conjunctivitis, diphtheria, meningitis, tuberculosis and typhoid fever are caused by separate and distinct varieties of rod-shaped germs or bacilli. The germs which cause syphilis are of the twisted type called spirilla.

Many diseases are due not to a single organism but to several species attacking a weakened part such as the bronchial tubes in bronchitis. Inflammation of the gall-bladder may be caused by several sorts of germs; similarly inflammation in the stomach, the intestines, etc. Influenza is probably one of these mixed infections, though a germ called the Pfeiffer bacillus is commonly called the influenza bacillus. The germs which cause smallpox, typhus fever, hydrophobia, mumps, etc., have not been found. The name of *virus* is given to a germ which is presumed to be the cause of certain diseases, but which cannot be found, possibly because it is so small that no microscope has yet been made that will enable it to be seen. The disease, however, behaves as if there were a germ causing it, so it is presumed that there is such a germ only we are at present unable to discover it. Certainly smallpox looks very like any other infectious disease caused by germs, so it may be supposed that it is in fact caused by a particular germ, although at present this germ has not been discovered. A form of germ which is known to always cause a definite disease is called the *specific organism* of that disease, as, for instance, the tubercle bacillus which is specific for tuberculosis. Many of these specific germs, however, can be present in the body in quite large numbers without causing an attack of the disease for which they are specific, because other conditions such as the resistant power of the body are too strong for them to gain the upper hand.

Aerobes and Anaerobes.—Some germs cannot live without the presence of oxygen and these are called *aerobes*. Others die in the presence of oxygen and are called *anaerobes*. Typical aerobes are the germs of diphtheria, anthrax and cerebro-spinal fever. Anaerobes which cannot live in the presence of oxygen are the virulent germ *b. Welchii* which causes gas gangrene, and the bacillus of lockjaw. Many germs will thrive either with or without oxygen such as the coccus of pneumonia and the bacillus of typhoid fever.

Germs are living things, both animal and vegetable. They therefore require food of

some sort or another in order to keep alive and grow. This food they obtain from water, air, or the chemical substances in the ground, the vegetable kingdom and animals, human or otherwise. In fact, all the visible world is swarming with germs and so is the invisible air. Fortunately, however, we are equipped with our own forces in our blood to render germs harmless to us except when for some reason our resistance is lowered and we let them get temporarily ahead of our fighting forces. Germs are killed off by solutions of carbolic acid, mercurial salts and other antiseptics, but our greatest ally in germ destruction is heat. Germs die off rapidly at a temperature of 108° F. or over, but as a general rule the exposure to heat must be kept up for twenty minutes at least. On the other hand, cold does not affect them much and in laboratories and places where it may be necessary to store germs for some time, they are often kept alive in a cooling chamber and are found to be none the worse for it. Direct sunlight is a powerful agent for killing germs, but it must fall directly on them and not through window-glass, which diminishes its power.

GESTATION.—Gestation is another name for pregnancy. (*See also* ECTOPIC GESTATION; PREGNANCY.)

GIDDINESS.—Giddiness is a sensation of unsteadiness of the body which is very often accompanied by a feeling of nausea. (*See also* DIZZINESS.)

GIN.—Gin is an alcoholic beverage made by distilling rye or barley, and flavoured with the juniper berry. It contains about 30 per cent. of alcohol, and in English gin only rectified spirit is used; while in Dutch gin the spirit used is not rectified. Gin acts on the kidneys and increases the flow of urine. Gin-drinker's liver is a popular name for alcoholic cirrhosis of the liver. (*See also* ALCOHOL; CIRRHOSIS OF THE LIVER.)

GINGER.—Ginger is the root of a plant which grows in India, Jamaica and other tropical countries. It has a very agreeable smell and a hot, pungent flavour. It is given in the treatment of flatulence and dyspepsia, and is used with purgatives to prevent griping pains. Half to 1 drachm of the syrup or of the tincture of ginger may be given.

GINGIVITIS.—This is a condition in which the gums become inflamed. Mild types of gingivitis may be caused by lack of cleanliness of the mouth, or by the use of too hard a tooth-brush.

Treatment.—Massage of the gums and the use of a mouth wash such as milk of magnesia will soon clear up the matter.

Ulcerative Gingivitis is due to an infection, and the gums become very swollen and painful and in severe cases the teeth may fall out. The infection may spread to the tonsils or the pharynx.

Treatment.—In ulcerative gingivitis it is advisable to call in the aid of the doctor so that the ulcers may be painted over with an antiseptic solution, and in addition the mouth should be washed out at frequent intervals. (*See also* PYORRHŒA.)

GIRDLE SENSATION.—This is a feeling of tightness around the waist which is often met with in diseases due to some disorder of the nervous system. It is generally associated with degeneration of the spinal cord and there may be symptoms of pernicious anæmia. The girdle sensation may feel as if a tight cord were tied firmly around the waist, or the sensation may spread from the chest to the abdomen. By finding out the exact area of the girdle sensation it is possible to tell at what level in the spinal cord the disease is situated.

GLANDERS.—Glanders is an infectious disease which is also known as farcy because of the "farcy buds" or nodules which appear under the skin and in the muscles. It is a disease which affects animals, especially horses, donkeys or mules, but it is contracted by people who come in contact with these animals. Infection usually occurs through the discharges of the diseased animal coming in contact with a cut on the hand or arm, or by the animal sneezing over the skin or in the face of its attendant.

Symptoms.—After infection has taken place the patient may complain of feeling very low in health and there may be some nausea and vomiting. Symptoms usually begin to appear about 3 to 10 days from the beginning of the infection; this is known as the incubation period. Abscesses may begin to appear on the hands, arms or face, and the skin around the abscess becomes very inflamed. The inside of the nose may become reddened and ulcers may form, followed by a sticky discharge. This condition usually lasts for about four months,

but very severe cases may prove fatal after a few weeks.

Treatment.—There is no specific treatment of glanders and treatment consists in dressing the ulcers with antiseptics, and in looking after the general health. The patient must be kept in bed, and the abscesses should be opened as they form.

GLANDS.—The glands of the body are organs which manufacture any of the substances which are necessary to the working of the body, and which help to get rid of substances out of the system which would be harmful to it. These organs are divided into two broad classes: the ordinary glands which have a passage (duct) leading from them into which their fluids flow, and the ductless glands which, as their name implies, have no ducts. The ductless glands include many of the structures such as the thyroid gland, the adrenals, and the pituitary gland, which are now known to exercise a great influence on the health of the body by the strong action of the powerful secretions they produce. These are dealt with in a separate article called Ductless Glands.

The ordinary glands of the body are grouped according to their use in the working of the body. There are the *lymph glands*. the *glands of elimination*, the *glands of assimilation* and a few glands for special purposes which do not come into these classes.

Lymph glands.—The lymph glands are widely scattered throughout the body. Their business is to protect the body from the action of harmful germs and substances. They are found in masses in such places as the armpits, the groins, the neck, under the knees and in the bend of the elbow, as well as amongst the deep substance of the body—the lungs, stomach, etc.

These lymph glands seem to be more active in childhood than at a later age. They act as the filters for the *lymph*—the colourless fluid which flows through the body in channels called the *lymphatic channels*, collecting the waste materials from the blood, and passing out nourishment into the tissues.

Glands of Elimination.—The glands which deal with the actual passage of waste material from the tissues of the body to the outside world are called the glands of elimination. The chief of these are the sweat glands, the sebaceous glands, the kidneys, and the mucous glands which are found in the linings of all the organs of the body. The sweat glands are to be found all over the skin but are more plentiful in some places than in others. For instance, the soles of the feet and the armpits are very well provided with sweat glands. The duty of the sweat glands is to get rid of surplus water out of the tissues in the form of sweat. This water which is given off is full of poisonous material which the body must get rid of. In diseases where there is an unusual amount of poisoning of the system going on, such as rheumatism, a very useful part of the treatment is to help the sweat glands to remove these poisons by making them act as freely as possible by means of hot baths, etc. The *sebaceous* glands are situated on the hairy parts of the skin and provide an oily substance which is necessary to the health of the skin.

The *kidneys* perform the greatest part of the work by clearing the body of its waste materials. They are described under their own heading. The organs of the body are lined with mucus and in this substance are numerous glands called the *mucous* glands, which provide a clear and sticky fluid which acts as an oiling material for keeping the mucous membranes moist. It is likely that they also protect the linings of the organs from attack by germs, because when germs in excessive quantity attack a part of the mucous membrane such as the lining of the nose or bowel, a larger quantity of mucus is produced by the mucous glands which serves to wash away large quantities of the germs as in a cold in the nose.

Glands of Assimilation.—The glands of assimilation are the glands which play a part in digestion of food, and absorption of the nourishment thus obtained into the body. Amongst these are all the glands of the mouth, such as the salivary glands, those of the stomach and intestinal tract, such as the glands in the duodenum, the liver and the pancreas. These are all explained under their own headings.

Glands, Diseases of.—Glands are liable to be overcome by the poisons they deal with and become inflamed and may form abscesses. They are also attacked, chiefly in childhood, by tuberculosis, and may become involved in secondary growths of cancer.

When a person talks of suffering from glands they generally mean infected, swollen

glands especially in the neck. Glands in the neck, especially in children, used to be a very common disease; but the condition is fast disappearing from our midst because the infection nearly always spreads to the glands of the neck from unhealthy conditions of the nose and throat, especially tonsils and adenoids. These unhealthy conditions are now cleared up before the glands have become infected. Tuberculosis still frequently attacks the glands in the support of the intestines which is called the *mesentery*. The blood condition called *leukæmia* in which the lymph glands become greatly swollen throughout the body is discussed under its own heading.

Glandular Fever is also discussed separately, as well as *Mumps*, in which the glands of the neck (the parotid glands) become greatly swollen.

GLANDULAR EXTRACTS.—In the last few years many experiments have been done to make use of extracts of some of the most important glands in the body. Many striking successes have followed the results of these experiments and probably the thyroid gland preparations are the oldest and best known. The extract is prepared from the thyroid glands of sheep, and each extract is standardized so as to ensure absolute purity and correct dosage. These preparations have proved very beneficial in the treatment of various conditions due to thyroid deficiency, especially myxœdema, which occurs chiefly in older women, and cretinism, a condition in which the individual does not develop normally from birth, owing to deficiency of the thyroid secretion.

Extracts from the suprarenal glands are now being used in the treatment of Addison's disease. Adrenaline, or epinephrin, and eucortone, are the names given to extracts from these glands, and they are intimately concerned with the growth and the sexual development of the body as well as the maintenance of life itself.

Extracts from the pituitary glands of animals are sold under various names such as pituitrin, pitibulin, pituglandol, etc. Injections of extract of the pituitary gland are given to stimulate the contraction of various muscles of the body, and especially to increase the contraction of the uterus so as to shorten the period of labour and to prevent bleeding after the child is born.

Injections of insulin are now given as a routine treatment in cases of diabetes. Insulin is prepared from the pancreas of sheep and oxen. Extracts of other glands are being experimented with and used, with the hope of lengthening the life of the human glands. It is unwise, however, for anyone to treat themselves with these extracts without the advice and the supervision of a doctor. (*See also* DUCTLESS GLANDS.)

GLANDULAR FEVER.—This is a condition in which the glands of the neck become swollen, and sometimes the glands under the arms and in the groin become affected. It usually occurs in epidemic form, especially in the autumn, and it may affect children living in one house, or children who are at school together. There is a moderate degree of fever which may last for a week or two.

Treatment.—The child should be put to bed and the neck kept warm by rolling a flannel bandage round it. Castor-oil may be given to keep the bowels open. The child should not be allowed up until a few days after the temperature has returned to normal, and convalescence may be slow as the general system may be very much depressed. Tonics and careful dieting will do much to build up the health and, if it is at all possible, a change of air would be very beneficial. This condition is very often mistaken for mumps, but though the two conditions are very similar, they are not the same, as different glands are involved. (*See also* GLANDS; MUMPS.)

GLAUBER'S SALT.—Glauber's salt, or sodium sulphate, is chiefly used as a saline purgative. It should be taken first thing in the morning in doses of a quarter of an ounce to half an ounce in a glass of water, or repeated smaller doses may be taken if desired.

GLAUCOMA.—Glaucoma is an eye disease whose special sign is a tendency to increase of pressure within the eye, resulting finally in destruction of the optic nerve fibres and blindness. There are different forms of the disease, but they are considered as mainly due to the difference in rate at which the tension increases. In some of the more acute forms the pupil is greenish, and it was to these cases that the word *glaucoma*, from the Greek word meaning sea-green, was originally applied. The word is now used as a general term for all forms of the disease.

Glaucoma may occur in infants, owing to an error of development, and is then known as "ox-eye" from its appearance. It is, however, most common in people of fifty or more and may follow great anxiety or emotion.

Symptoms.—An acute attack usually begins at night with severe neuralgic pains in the eye and the same side of the head, which may last for two or three days. The pain may be so acute as to cause sickness, and the patient mistakenly thinks the attack to be "only a sick headache." It is these cases that are so dangerous; they may destroy the sight beyond repair in a day; but an ordinarily severe case goes on for about a week, and a chronic case many months, before damage is caused.

There are all varieties between the acute and the chronic. The latter often comes on so gradually and painlessly that it is disregarded until serious damage has been done; sometimes it comes on by steps, so to speak, the patient having a series of more or less severe "bouts," with clouding of vision. They pass away after some minutes or hours, each attack, however, leaving the sight worse than before. In chronic cases artificial lights appear to be surrounded by coloured "halos," and there are various other peculiarities of sight, such as lessening of the field of vision. The veins on the surface are distended, so that the eye is bloodshot. The pupil is wide and oval instead of being small and round, and may be greenish. The eye is harder than usual, and vision is hazy.

Treatment.—The outlook in glaucoma is always serious as regards the sight, and the sooner treatment is commenced the better, especially in the acute cases. Formerly, the disease was regarded as incurable; but, in 1857, von Graefe introduced an operation in which a small piece of the iris was removed at one point. This is still the operation for choice in acute cases; in the less acute cases another operation is performed, where a small portion of the white of the eye is removed.

If the condition is very chronic, or if an operation is inadvisable, *eserine* drops are used. Eserine contracts the pupil and helps to open the angle of filtration. This treatment may be continued as long as desired.

GLEET.—Gleet is the name given to a discharge from the urethra, generally found after an attack of gonorrhœa. (*See also* GONORRHŒA.)

GLOBUS HYSTERICUS.—A common complaint in hysteria in which there is a choking sensation as if a ball were obstructing the throat. This is probably a more pronounced example of the feeling of a "lump in the throat" which is sometimes felt when the emotions are stirred. (*See also* EMOTION; HYSTERIA.)

GLOSSITIS.—Glossitis means inflammation of the tongue. (*See also* TONGUE, DISEASES OF.)

GLOSSY SKIN.—This abnormal condition is seen on an area of skin, the nerve supplying which is injured or diseased. The skin's functions cease, and atrophy is said to set in; the skin becomes smooth, glossy and lifeless in appearance. The nerve of supply may be damaged in various ways, either by a direct injury, such as a gun-shot wound; by a disease of the central nervous system, such as multiple neuritis; or by a general disease, such as leprosy, gout, or rheumatism.

Treatment.—The condition tends to disappear after a time, varying from a few weeks to a few years. No treatment beyond that of the causal disease is of any use; but lanoline or any mild ointment may be rubbed into the affected skin to preserve its health as far as possible. If pain is present, as sometimes happens, it may be relieved by either hot or cold applications. (*See also* MULTIPLE NEURITIS.)

GLOTTIS.—The narrow opening at the upper end of the larynx, or voice-box, is known as the glottis. It varies in width and shape with the movements of the vocal cords. During ordinary quiet breathing the glottis is open, but while the vocal cords are being used as in speech or singing, the opening is reduced to a mere slit. The narrow opening of the glottis is called in medical language, the rima glottidis. (*See also* LARYNX.)

GLUCOSE.—Glucose is also known as dextrose and it is the form of sugar which is found in ripe fruits—especially grapes. It is also in honey and, of course, in jam made with fruits. It is an important article in the diet as it forms a very valuable food which is easily digested. Ordinary cane sugar has to undergo a chemical change before it is digested; but glucose is what might be termed a predigested substance,

so is particularly beneficial to people with weak digestions. It is also of great importance in those cases where nourishment cannot be taken by mouth and rectal feeding has to be adopted. An enema containing glucose will provide sufficient nourishment to tide a patient over a critical period, or a carefully sterilized injection may be given directly into the veins.

The body is only able to deal with a certain amount of glucose, and if this amount is exceeded, the surplus glucose is given off in the urine. This is one of the chief symptoms in the disease known as diabetes. (*See also* DIABETES; URINE.)

GLUCOSIDE.—There are many substances from which glucose—and another substance which is not sugar—can be obtained. These substances are known as glucosides. The more important ones are amygdalin, arbutin, digitalin and salicin.

GLUTEAL ARTERY.—A large and important artery situated in the buttocks. This artery breaks up in various branches which supply blood to the lower limbs. (*See also* ARTERY.)

GLUTEN.—Gluten is a substance found in the seed of cereals. Gluten bread is specially prepared bread made from wheat-flour from which all the starch has been removed. It is used a great deal by people who are on special diets, particularly those who cannot take a large amount of carbohydrates, as in diabetes. (*See also* DIABETES; SUPPLEMENT ON DIET AND INVALID COOKERY.)

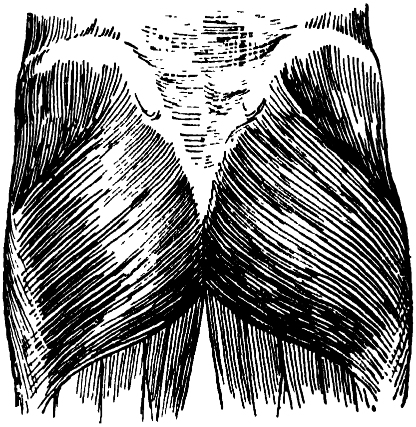
GLUTEUS MAXIMUS.—The chief muscle of the buttock. It helps to join the thigh-bone to the pelvis.

GLYCERINE.—Glycerine is a sweet, heavy fluid which is capable of absorbing water, and for this reason it is used a great deal on the hands to keep them from getting chapped. Rose water is usually added to give it more perfume. Because glycerine is so easily absorbed by the skin, it is often added to other substances such as iodine, tannic acid, salicin, etc., and applied to wounds, or to the unbroken skin through which they enter the body.

Glycerine has a very soothing effect on the mucous membranes, and for this reason it is used with tannic acid or iodine as a paint in cases of sore throat. Internally it has been given as a purgative in doses of 1 or 2 teaspoonfuls either by mouth, but especially in the form of an enema. The result is prompt, usually occurring within less than half an hour, and there is very little pain or internal disturbance.

GLYCOSURIA.—The presence of sugar in the urine is known as glycosuria. It is true that sugar in the urine is one of the chief symptoms of diabetes, but its presence does not always signify that diabetes is the cause. Special tests can be made to prove whether the glycosuria is due to true diabetes or whether the excess of sugar in the urine is merely due to some other cause.

Amongst the conditions which cause sugar to appear in the urine, probably the most



Gluteus Maximus

common is faulty diet. If too much starchy food is taken, in other words, if the diet is over-balanced with carbohydrates, the excess sugar which the body is not able to deal with will be poured out in the urine. This condition is known as *alimentary glycosuria*, and it is met with in stout people and those who are over-fond of the good things of the table. Any disturbance of the nervous system, or of the kidneys, may also cause sugar to appear in the urine. Occasionally during pregnancy, or after a severe mental shock, glycosuria is to be found. As a general rule, if glycosuria occurs in young people it is a symptom of true diabetes, which is a very serious condition indeed; while in people over fifty it is most commonly met with in those who eat and drink too much. With due care, however, the condition can be controlled to a large extent. (*See also* DIABETES; URINE.)

GNAT.—When we refer to gnats we usually mean mosquitoes or any of the other little blood-sucking flies which torment us in the summer. For treatment of gnat-bites *see also* BITES AND STINGS.

GOA POWDER.—Goa powder is also known as chrysarobin and araroba. It is used in the form of an ointment for certain skin diseases, especially ringworm, but care must be taken not to use it over too long a period as it is liable to give rise to irritation. Goa powder stains the skin a yellowish-brown colour, and bed-linen which comes in contact with it will become stained also, although the stains can be removed from the linen by a weak solution of caustic soda or chlorinated lime.

GOITRE.—An enlargement of the thyroid gland, which is one of the ductless glands and lies in the neck in front of the windpipe, is known as a goitre or bronchocele. There are two main types of goitre, simple and exophthalmic. Exophthalmic goitre is dealt with fully under its own heading, and only the simple type will be discussed in this article. The thyroid gland when it is working in a normal fashion does not show in the neck, although there are occasions when the gland varies in size and activity even in healthy persons. A temporary enlargement of the thyroid gland is not unusual in females during the menstrual period, as well as during pregnancy. Such a temporary swelling is, of course, not a goitre, but at the same time it has been found that goitre is far commoner in women than in men and it is often associated with puberty, pregnancy and lactation.



Drawing showing Exophthalmic Goitre

Simple goitre is characterized by a very marked swelling in the front of the throat, and there is usually very little difficulty in recognizing that it is due to the thyroid gland. A simple goitre appearing at puberty or during pregnancy often disappears in a few months; but if it is definitely associated with a district in which goitre is a common occurrence, then it is usually permanent, while the person remains in that district.

Causes.—There are two main theories as to the cause of goitre. It is thought that some drinking-waters lack iodine, while again it has been suggested that it may be due to a micro-organism in the water. Certainly there is no doubt that the waters of some districts are definitely goitrous, and the deep valleys in mountainous districts seem to be mostly affected. For example, it is very common in the Swiss Alps, the Italian Alps and in the mountainous parts of Germany. In India it is common among the Himalayas, and in England it occurs so often in the hilly parts of Derbyshire that the condition is known by the name of Derbyshire neck. It is also very common in parts of America where there is supposed to be a decided lack of iodine in the soil. It is important to note that people may be cured of the condition by removal to another district, just as a healthy person may develop goitre by settling in a district where it prevails.

Symptoms.—Swelling of the thyroid gland may begin between the eighth and twelfth year, but as a rule its growth is at first very gradual. Later on the swelling may be very marked indeed, though there is rarely any pain. The patient is always able to swallow quite easily, and it is only when the swelling becomes very large that it interferes with breathing. During the early stages, the swelling is not hard, but in the course of time it may become firm and irregular. There are usually very definite signs of nervousness in the patient, especially if the goitre is due to

over-activity of the thyroid gland (hyperthyroidism). In cases of lessened activity (hypothyroidism) there may be a tendency towards fatness and sluggishness.

Treatment.—In cases where it is at all possible, a change of residence should be the first step in the cure. If this is not possible, a pure supply of drinking-water or the use of boiled water has produced very good results. Small doses of iodine are beneficial, or the swelling may be made to subside by small doses of extract of sheep's thyroid. In cases where the swelling is very unsightly, or where it is causing pressure and interfering with the breathing, a surgical operation may have to be performed. An operation is also advisable in those cases where a tumour or cyst has formed in the gland, otherwise there is the possibility that malignant changes may take place. Nowadays the surgeon never removes the whole of the gland which is the seat of the goitre, as this brings about the condition known as myxœdema, a disease due to failure of the thyroid gland. (*See also* DUCTLESS GLANDS; EXOPHTHALMIC GOITRE; MYXŒDEMA.)

GONORRHŒA.—Gonorrhœa is a very common type of infectious venereal disease and is the cause of a great deal of ill-health and chronic invalidism, especially in women. It is caused by a germ called the gonococcus, which gains entrance to the child-bearing organs and urinary tract, usually through the act of sexual intercourse, though occasionally it may be acquired through using a towel which may have been used by someone suffering from the disease.

Symptoms in Females.—The patient complains of scalding pain on passing water, accompanied by a burning feeling, and irritation in the private parts, and a thick "creamy" discharge which develops in a few days' time into a thin watery discharge which is not so irritating. Later on, there may be pain in the lower part of the abdomen and warts and sore places on the private parts. The discharge causes discomfort and soreness round the private parts and on the sides of the thighs. Sometimes the germ gets into the blood-stream and causes an "acute gonococcal rheumatism," and sometimes serious heart trouble.

Treatment (Female).—It is of great importance to get medical treatment within the first few days if possible, as the earlier the treatment begins the less likelihood there is of complications. The patient should rest in bed on light fluid diet, keeping the bowels open with senna, liquorice, or salts. Hot vaginal douches at a temperature of 115° F. should be given. Ichthyol pessaries (10 per cent.), tonics, serum and vaccine treatment are all used.

Complication in Women: Bartholinian cyst, which is a tender swelling inside the private parts which may become as large as two or three inches across and often forms a very painful abscess, is sometimes a complication of gonorrhœa. The cyst may burst of its own accord, discharging pus, but it nearly always fills up again.

Treatment.—The most satisfactory is surgical, when the cyst is entirely cut out.

Acute Cervicitis.—The infection may spread into the upper parts of the vagina, setting up inflammation in the walls of the cavity and infecting the neck of the womb which is called the *cervix*. This is a difficult condition to cure as the cervix contains deep-seated glands (or pockets) in which the germs hide themselves sometimes for a number of years.

Treatment.—The special treatment consists in local applications to the part of disinfectants. This can be done by inserting gelatine pessaries or plugs containing a preparation of silver such as argyrol or protargol. These pessaries have to be pushed up the cavity as far as possible to reach the cervix, and while they are being used, douching should be avoided. Glycerine treatment by the doctor is becoming increasingly popular.

Chronic Cervicitis.—This is a condition where the disease has been going on perhaps for years and the cervix has become very unhealthy, enlarged, thickened and perhaps ulcerated. It is a continual source of infection and danger to the woman, and sometimes a cervix in this condition develops into cancer at the change of life. This is the reason why any woman who has irregular bleeding during the change of life especially, should be examined internally, by a doctor.

Treatment.—The treatment in these old standing cases usually presents grave difficulties. It may follow the same lines as for acute cervicitis, but each case must be considered individually and surgical operation may be necessary in some instances.

Endometritis (Inflammation of the Womb).—This is a condition which has spread up from the neck of the womb to the lining of the womb. The chief symptoms are a thin watery discharge (leucorrhœa) commonly known as "the whites," excessive loss of blood at the periods accompanied by pain and a dull aching in the lower part of the back. There may also be constipation, "nerves," and general ill-health.

Treatment.—In the acute stages the treatment consists of disinfecting the cavity of the womb under an anæsthetic, but where the condition has become very chronic, the whole womb may have to be removed (hysterectomy) before the patient is cured.

Salpingitis and Oophoritis.—This is a condition where the germ has spread from the inside of the womb along the tubes, causing inflammation in them and in the ovaries which are attached to them. This may lead to a thickening and sealing-up of the tubes (salpingitis) causing an inability to become pregnant (sterility) and also to disease and perhaps abscess of the ovaries (Oophoritis).

Symptoms.—The symptoms of an acute attack in a tube somewhat resemble those of an attack of appendicitis. The patient goes to bed with a pain in the lower part of the body, either on the right or left or perhaps on both sides. She is feverish and feels ill. The attack settles down in a day or two, but returns at intervals until the patient has developed into a state where she has always a certain amount of pain and tenderness in the pelvis and has chronic ill-health.

Treatment.—The treatment of these cases is surgical or by diathermy (electrical heat), but a good deal can be done towards relieving the symptoms by giving large, hot vaginal douches (115° F.), very slowly twice a day, and by using glycerine and ichthyol pessaries (10 per cent.) at night inserted as high as possible. A good tonic such as Easton's syrup (a small teaspoonful three times a day after meals) and a daily dose of salts to relieve constipation are very helpful.

Urethritis and Cystitis.—In these conditions the germ has attacked the bladder and the opening into the bladder. The patient complains of pain on passing water and also of having to do so very often. When this condition occurs, there is usually another germ to blame as well as the gonococcus.

Treatment.—The treatment is rest in bed during the acute stages on low diet, drinking lots of barley water and plain water, and taking salts to keep the bowels open and medicine to disinfect the urine. In chronic cases, the bladder may have to be washed out frequently with silver nitrate.

Gonorrhœa in Men: Symptoms.—The disease comes on suddenly with irritation at the outlet of the pipe, combined in a few days with scalding during the passing of water and also with a thick creamy discharge which tends to persist and become worse if the condition is left untreated. There may also be pain in the groin and a painful little lump on one side or the other.

Treatment (Men).—Rest in bed, with light nourishing diet, large quantities of bland fluids and no alcohol, attention to the bowels and irrigation (wash out) of the pipe by a doctor. The patient should on no account carry out the irrigation himself unless shown how to do it by a doctor, as wash-outs improperly done push the disease back still further down the pipe. If the patient is out of bed a suspensory bandage should be worn. Great care must be taken to avoid infecting the eyes with the hands.

Complications in the Male: U ethritis and infection of the bladder, and possibly also the kidneys, are the chief complications in men and call for frequent irrigation of the part with weak permanganate or protargol by a doctor in acute cases, and one or two injections of manganese butyrate given into the muscular tissue often has a wonderful effect in cutting short the course of the disease. If the inflammation of the urethra is allowed to become chronic it leads to thickening of the tissues and narrowing of the passage into the bladder. This is sometimes so troublesome that the patient cannot pass water at all and instruments (bougies) have to be passed to make the passage wider. In all cases it is a good thing to flush the organs out by drinking large quantities of water and by taking medicine to disinfect the urine.

Prostatitis.—Inflammation of the prostate from the urethra may be a complication of gonorrhœa and will need treatment such as rest, massage, or perhaps surgical treatment.

Epididymitis.—This condition is caused by inflammation of the duct known as the epididymis, which lies to the back of the testicles. Where the condition is due to

gonorrhœa, rest should be obtained for the part by wearing a suspensory bandage and the treatment for gonorrhœa should be carried out.

Periurethral Abscess.—When an abscess occurs in the region of the urethra the treatment is surgical.

Conclusion.—In all cases of gonorrhœa, whether male or female, there is a risk of an attack of acute infection of the joints (acute gonococcal rheumatism). The treatment for this is rest in bed—with the joints kept at rest—followed by gentle massage, opening medicine, tonics, light diet, and treatment by vaccines or serum.

In any case of gonorrhœa, great care should be taken not to spread the infection to the eyes through getting the germ on the fingers, thus causing the very serious condition called gonorrhœal conjunctivitis. This condition is the most common cause of blindness from birth. The baby's eyes become infected from the vaginal discharge of the mother, and unless treated immediately with a strong silver preparation such as protargol or argyrol, the sight is permanently damaged.

In *all* cases of gonorrhœa it is *urgent* that the patient should receive medical treatment immediately, the alternative being more or less chronic invalidism for life, as well as the possible infection of others.

GOOSEFLESH.—This is a very common condition which is brought on by cold, fright, etc. The minute muscles in the skin contract and cause tiny raised lumps all over the skin which are called "gooseflesh" because in appearance the skin resembles that of a plucked goose. It disappears of its own accord when the fright is over or the skin is warm again. Many people of rheumatic tendency have a sort of gooseflesh on the arms and legs which is more or less chronic, coming and going with the state of the health. Acne also causes a goosefleshy appearance on the legs and arms in which there are little acne pustules.

Treatment.—For gooseflesh which appears to be fairly chronic, improve the general health, apply friction to the arms and legs by vigorous rubbing with a loofah every day, and use a sulphur soap which may be adapted to use instead of sulphur ointment by rubbing on fairly dry at night and leaving on until the morning. If the goosefleshy appearance does not clear up see a skin specialist, as the condition must be one of some definite skin trouble such as acne, dermatitis, or some form of lichen.

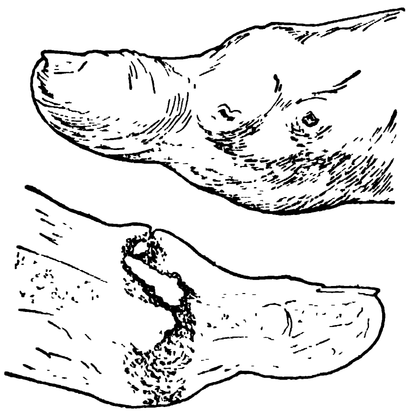
GOULARD'S WATER.—This is a popular term for a diluted solution of lead subacetate which is known as Goulard's extract. The lotion is applied to severe bruises and sprains, or to burns and other injuries. It is also used in the treatment of dermatitis as it dries up the sores without leaving too hard a crust. This solution must not be used over too long a period as absorption may cause lead poisoning.

GOUT.—Gout is a painful disease in which there is an excess of the substance called uric acid in the blood. It has a marked tendency to be hereditary, and may be regarded as the best example of a disease in which the children suffer for the (medical) sins of their fathers unto the third and fourth generation. The person who comes from "gouty stock" may become typically gouty in his old age, or he may be afflicted with various degrees of ill health in which one or other of the systems of his body is chronically below par. Such people are those who suffer from *allergic* diseases, early circulatory degeneration and so on. This tendency to inherit the liability to gouty troubles is called the gouty *diathesis*. Fortunately, the outlook is not as black as might appear from the above remarks because, in the first place, few of us expect to be physically perfect; and secondly we are already a couple of generations away from the heyday of goutiness; it is a condition which is decidedly on the wane with the disappearance of the heavy drinking and eating habits of our great-grandparents. Gout is no longer the scourge it was, although the "gouty diathesis" is still present in a large proportion of the population.

Causes of Gout.—The gouty diathesis or hereditary predisposition to gout is important and men are more often attacked than women. Alcohol plays a large part in causing gout and it is noticeable that the fermented liquors are more dangerous than the distilled spirits. Poisoning by lead may also cause gouty symptoms. Rich food in excess combined with lack of exercise and indulgence in liquor may be said to be the root evils in causing gout. On the other hand, poor feeding combined with faulty hygiene and over indulgence in malted liquors also causes gout. For this reason it is popular to talk

of two sorts of gout, "rich man's gout" and "poor man's gout." Workers in breweries and other people who deal with alcohol in large quantities are liable to become gouty.

Symptoms.—In a typical attack of gout the patient may be awakened in the morning with a severe pain in a joint, usually the joint of the big toe or a thumb. The joint swells and becomes intensely hot and painful so that the victim cannot bear to have it touched or to move it. Any jarring of the foot will cause him to cry out with pain. A feeling of illness may also be present, such as headache,



Gouty Big Toe: The Section shows Tophi

vomiting and feverishness. If treatment is begun the swelling and pain in the joint will subside in a few days and the joint will return to its former state; but the attack will almost certainly return perhaps in a few months' time or perhaps after a couple of years. The next attack will be identical with the first or a new joint may be affected. As time goes on the attacks become more frequent; or after a few attacks the condition may become more or less chronic. Chalky deposits called *tophi* are found in the proximity of joints and tendons, most frequently round the joints of the large toes, and fingers, and often in the outer rim of the ear. The presence of these tophi makes the diagnosis of gout a certainty. The affected joints lose a good deal of their power. Gouty people are subject to skin diseases and frequently are asthmatical.

Treatment.—Treatment must be aimed at keeping the gout at bay, and avoiding acute attacks which need never occur where a reasonable endeavour is made to counteract the gout. The rule should be to live temperately, eating moderately and restricting the diet as far as meat, liver, coffee are concerned. White bread, butter, milk puddings, green vegetables and fruit are good. Alcohol must be avoided and salt should be left out of the food. It is well to take large quantities of water or mineral water between meals. Spa treatment is a valuable beginning to the treatment of gout, because it gives the patient an opportunity of breaking completely with the old bad habits of diet and hygiene which surround him at home. There used to be a saying "once gouty, always gouty," but this need not be so. With care it is not necessary to have acute attacks of gout such as were taken as a matter of course fifty years ago and, in fact, these are becoming a rarity owing to the advancement of knowledge of hygiene and health matters.

G.P.I.—The medical abbreviation for General Paralysis of the Insane, *which see.*

GRAFTING.—By grafting we mean the operation of removing a small piece of human skin, bone or nerve from one part of the body in order to transplant it in another part. This operation has to be done when a vital piece of bone or muscle has been destroyed and can be replaced by a piece from a less vital part of the body. Skin from another part is grafted to cover unsightly injuries on the face, for instance.

Bone grafting was first used extensively in the war and some remarkable results were obtained as well as many failures and partial failures. It is used in civilian life to fill in gaps in the skull and thus protect the exposed brain from injury, and in tuberculous disease of the spine to strengthen the diseased parts of the spine.

Skin grafting is the most successful form of grafting and usually gives very good results. The attempt to graft glands of young animals (monkey glands) into human beings in order to replace the functions of glands which have become old has not been successful, as it is not known how to make a transplanted gland continue to live in the human body for any length of time.

GRAND MAL.—This is a French name, meaning "great evil," used in connection with a major epileptic fit as opposed to petit mal or a minor epileptic fit. In grand mal the fit is much deeper and more lasting, while in petit mal there may be only a slight loss of consciousness. (*See also* EPILEPSY.)

GRANULATION TISSUE.—When a wound or a cut is healing, new large, round cells form to connect the surfaces together. These new cells are called granulation tissue because the surface appears to be studded with little grains. As soon as a cut takes place, Nature begins her work of repairing the damage, and the tiny blood-vessels around the cut begin to expand and develop into new round cells. Granulation tissue when it is in a healthy state should be of a rich, deep red colour and, as healing takes place, the area should gradually become smaller, until eventually only a slight scar is left. It sometimes happens that there is an overgrowth of granulation tissue; this is called exuberant granulation, or the slight swelling which takes place round the wound is often popularly referred to as proud flesh. (*See also* INFLAMMATION; PROUD FLESH.)

GRANULOMA.—This term means a tumour which has formed on granulation tissue. This is caused by various forms of inflammation such as occur in tuberculosis, syphilis, leprosy, yaws and glanders.

GRAPE SUGAR.—This is another name for glucose and dextrose. This name grape sugar is used because of the large quantity of glucose found in ripe grapes. (*See also* GLUCOSE.)

GRAVEL.—Under certain conditions, stones may form in the kidneys owing to deposits of uric acid. In some cases these stones may be quite large in size and only one may form, or there may be a large collection of very tiny ones. Gravel is the name given to the collection of very fine stones which are so small that they are able to pass into the bladder and then through the urethra along with the urine. Gravel can be detected as a sediment in the urine as soon as it is passed. (*See also* BLADDER; CALCULUS; URINE.)

GRAVES' DISEASE.—Exophthalmic goitre is associated with the name of Dr. Graves, the Irish physician who was the first to give a full description of the disease in 1835. (*See also* EXOPHTHALMIC GOITRE.)

GRAVID.—Gravid means pregnant. It is most commonly used in connection with the pregnant womb, which is described as a gravid uterus. It is not customary to talk of a gravid woman, but a pregnant woman.

GREEN BLINDNESS.—This is a form of colour blindness which also goes under the name of red-green blindness. It is the commonest form of colour blindness and occurs oftener in men than in women. In this condition there is an inability to distinguish green and red. (*See also* COLOUR BLINDNESS.)

GREEN SICKNESS.—This is a form of anæmia which has the medical name of chlorosis. (*See also* ANÆMIA.)

GREENSTICK FRACTURE.—In a young child the bones, like the young green branches of a tree, are not so brittle as when they are fully matured, so that they are more inclined to bend than to snap in two when they receive a violent blow. This bending is known as a *greenstick fracture.* (*See also* FRACTURES.)

GREGORY'S MIXTURE or POWDER.—This is a popular and useful purgative for small children which is made up of rhubarb, heavy magnesium carbonate, light magnesium carbonate and ginger.

GREY HAIR.—Grey hair comes to everyone who lives long enough, but some people go grey long before the usual age. Both sorts of grey hair are discussed in the article on Grey Hair (canities) in the SPECIAL SUPPLEMENT ON BEAUTY CULTURE.

GREY MATTER.—The grey matter of the brain is the brain tissue in which most of the nerve cells are situated, and is therefore of the greatest importance in the working of the body. (*See also* BRAIN.)

GREY POWDER.—A powder composed of mercury and chalk is called grey powder. It makes an excellent purgative, and mixed with a little sugar it is easily given to children. Infants and children suffering from diarrhœa can be treated with grey powder, as this will remove undesirable substances from the bowel without causing griping.

GRINDELIA.—A drug is obtained from the dried leaves and flowering tops of the grindelia plant which grows in the Rocky Mountains. This drug is a valuable remedy in the treatment of asthma, and it is also useful in cases of chronic bronchitis. The drug is also an expectorant, which means that it enables the sputum to be discharged more freely from the bronchial tubes. Special asthma cigarettes can be obtained with this drug in them. It is very bitter and the taste is best concealed by alcohol.

GRIPING.—Griping is a type of pain set up by the presence of some irritating substance in the bowel. The contents of the bowel are normally sent forward by a series

of gentle motions due to the contraction of the muscles of the wall of the bowel. This movement is known as peristalsis. When some irritating substance such as poisonous food or too strong a purgative is present in the bowel, these movements become more violent in nature and the increased contractions of the muscles cause the griping pains. When strong purgatives are prescribed it is usual for the doctor to include some soothing medicine to prevent severe griping. (*See also* COLIC; FLATULENCE; INTESTINES.)

GRIPPE.—This is a French term for influenza. English people often refer to it as the grip. (*See also* INFLUENZA.)

GRISTLE.—Gristle is the popular name for cartilage. Cartilage in the human body is very similar in composition and appearance to the gristle of animals which is easily recognized in meat. (*See also* CARTILAGE.)

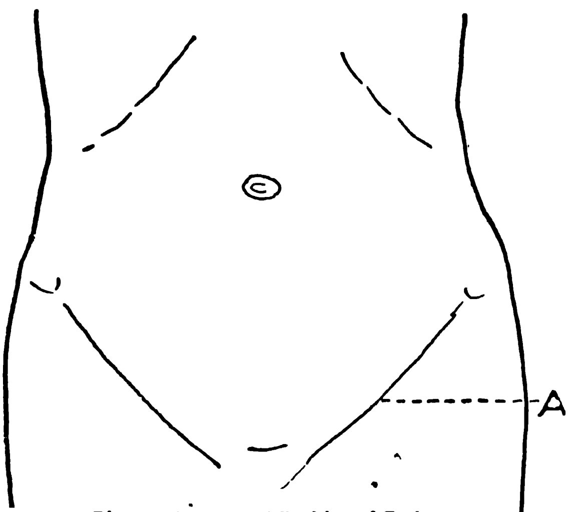


Diagram Illustrating Position of Groin

GROCER'S ITCH.—A skin disease which appears on the hands and wrists of grocers which is caused by the handling of sugar or other substances. (*See also* DERMATITIS.)

GROIN.—The groin is that part of the body where the abdomen and the front of the thigh meet. It is marked by a slight groove or furrow, and in very stout people, friction may occur if absolute cleanliness is not observed. This is particularly so in fat babies, and careful attention should be given to see that the parts are washed, dried and powdered after each napkin is changed.

The groin is important because of the large blood-vessels which lie just under the skin, and also because of the lymph glands which are grouped there. These glands frequently become enlarged in diseased conditions and are then sometimes referred to as buboes. Bubonic plague gets its name from the enlargement of these glands. Pain, and enlargement of the glands in the groin, may occur through some other part of the body being diseased. The nerves which come from the spinal cord may carry pain to the groin; such a situation may arise when the spinal cord is diseased or when the kidneys or reproductive organs are diseased.

GROUND TEMPERATURE.—This is an alternative term for earth temperature. The temperature of the earth is closely associated with epidemics of certain diseases. (*See also* EARTH TEMPERATURE.)

GROWING PAINS. — Many children complain of dull aching pains in the arms or legs which the mother simply puts down to growing pains. The vague term of "growing pains" has been used for years without any real basis for its use, because the progress of growth should cause no pain to a child. It is generally believed that these pains are actually a mild form of rheumatism, and it has been found that the majority of children who suffer from these pains show other symptoms of the presence of rheumatism.

A child with growing pains should be given more careful attention and not be allowed to go in for excessive exercise, because there is a distinct possibility that the heart may become affected. If the pains are very bad, the child should be put to bed for a few days, and the diet should be light and nourishing. The outdoor clothing should always be warm, but not too heavy. (*See also* RHEUMATISM.)

GROWTH.—The following points give a fair estimate of children's height at different ages as set down by authorities in this matter; it must not, however, be taken as an infallible guide:

Height.—The new-born baby's height—or length—is about twenty inches.

Children grow more in the summer-time than in winter, probably because of the sun.

Up to the age of five years growth is said to be faster than at other periods of life.

From five to ten years, boys grow faster than girls.

From ten to fifteen years, girls grow faster than boys.

From fifteen to twenty, boys grow faster than girls.

Up to fourteen, two and a half inches a year may be added by both boys and girls.

At twenty, girls reach their full height.

At twenty-four, boys reach their full height.

Some authorities say that soon after the age of two years the child is half as tall as it will be when fully grown. If this is so, we ought to be able to calculate the adult height of children at a tender age. But so much depends on food, on family characteristics, on conditions bodily and mental, on health or sickness, to say nothing of those mysterious little organs of the body known as ductless glands, to which scientists are paying great attention, that no rule can be laid down at the present state of knowledge.

Weight.—The new-born baby weighs from seven to eight pounds.

Children grow in weight more in winter than in summer.

From five to ten years of age weight grows at the rate of from four to five pounds a year.

From ten to fifteen years it may increase from eight to ten pounds a year.

From five to ten years of age girls weigh a little more than boys.

Up to fifteen years, both boys and girls may put on from eight to ten pounds in one year.

From when the "growing age" stops—at twenty or even some years earlier for girls and twenty-four for boys—up to middle age, say fifty, weight increases at something like three-quarters of a pound a year.

At fifty, increase in weight should stop and even get less, if we want to keep well, lead an active life and live to a reasonably old age.

But, as pointed out above in speaking of height, so many influences must be taken into account that these figures can only be considered as rough calculations.

Keeping Records.—In the days when the children's heights were carefully noted on the sitting-room door, weight was not regarded as of so much importance as it is now. Welfare work throughout the country has done an immense amount of good if only in the respect it has taught parents to pay to the question of their children's weight. When a poor mother has learnt to bring her baby regularly to the welfare clinic she says, "Please I've come for the welfare," meaning "Please will you weigh my baby and tell me if I'm feeding him properly?"

Many mothers keep a book in which they enter the child's weight, height and other particulars, at various ages, and mount photographs showing progress in growth. This is an excellent plan.

Among influences that affect growth are housing—whether there is plenty of open space, fresh air and sunshine; whether there has been serious illness in the family history, above all whether the child is being brought up in happy and natural surroundings, not forced on in mental development at the expense of health, whether it gets enough sleep in a quiet room, whether or not it is encouraged to get over-excited at parties, etc. All these things are of vital importance if the child is to grow as it should.

Growing pains, as they are called, are signs that a doctor's advice is needed, for they are caused not by growth but by rheumatism, and there may be danger of heart trouble arising from them if neglected.

Giants and Dwarfs.—Stories of giants and dwarfs have always been favourites with tellers of tales as well as with their listeners. We think at once of Goliath, killed by little David; of the giant slain by Jack the Giant-killer; and, in general, it seems that the brains always go to the little fellow, while the giant is stupid as well as malicious. What accounts for extremes in size we cannot say, but there is an idea that the ductless glands, spoken of above, have a good deal to do with the fact that some children grow very big while others seem hardly to grow at all.

Dwarfs, of course, are people who have not grown, or grown very little, from babyhood, and when we know more about the effect on the child of food and surroundings, and of those mysterious glands, it may be possible so to treat and feed unduly small babies that they will not be handicapped in this way throughout their lives. Already a great deal is being done by right feeding and treatment to overcome a bad start, and everyone must

admire the work of the children's hospitals where undersized babies born before they are due are so wonderfully cared for that they grow into bonny children.

Perhaps the smallest dwarf on record is a certain Jeffrey Hudson, born in the smallest county in England, Rutlandshire, who is said to have been only eighteen inches high from his eighth to his thirtieth year, then to have grown to a yard and a quarter, and to have lived to the age of sixty-three. Henrietta Maria, Queen of Charles I, like other ladies of her time, was fond of having a dwarf to amuse and wait on her, and Hudson is said to have been presented to her by the Duchess of Buckingham. The Queen also had a dwarf called Gibson, whom she encouraged to marry a lady dwarf named Anne; they had nine children, five of whom were of ordinary size. Gibson is buried in St. Paul's Church, Covent Garden. Another story comes from France, where during the revolution in the last century a dwarf named Richebourg—who lived to the age of ninety years—is said to have carried dangerous dispatches while lying in the arms of his "nurse."

Are Girls Growing Bigger?—Not so many years ago small women used to buy their "ready-mades" in the girls' department of big shops. Nowadays, however, the small woman is catered for by many stores and manufacturers, while the so-called girls' sizes are enormous. It really looks as if, with the greater attention paid to food, sleep and health, as well as to "gym" and games, unfettered modern ways and dress, we were producing a new race of Amazons.

It has long been known, however, that at the age of fifteen girls are a little taller and heavier than boys.

Large Creatures and Small.—Compared with human beings the growing-life of the elephant and the house-fly are interesting. The animal, we are told, goes on growing up to the age of thirty, while the insect's whole life may not last, in hot weather, more than twenty-four hours all told. (*See also* ACHONDROPLASIA; DUCTLESS GLANDS; PITUITARY.)

GROWTHS.—By growths we mean any abnormal formation occurring in the body and continuing to grow there. The most common growths are tumours and cysts, but corns and any sort of lumps are also growths. Growths are divided into two classes, benign and malignant. *Benign* growths are those which do not seriously interfere with the functioning of the body, whereas *malignant* growths are those such as cancer which shorten life.

GRUEL.—Gruel is a liquid invalid food made from oatmeal which is of great value in sickness. A recipe for making it will be found in the SPECIAL SUPPLEMENT ON DIET AND INVALID COOKERY.

GUAIACOL.—Guaiacol is a colourless liquid which is used in the treatment of tuberculosis. It is obtained from beech-wood creosote and may also be prepared synthetically. It is used as a substitute for creosote. Owing to its pungent taste it is best given in capsule form, or dissolved in cod-liver oil or sherry. Guaiacol *carbonate* is a useful drug in the treatment of rheumatoid arthritis, and it may also be used for tuberculosis in place of guaiacol. It is a white, tasteless powder.

GUAIACUM.—A resin which is used in the treatment of chronic rheumatism and lumbago. It also acts as a laxative and is useful for stimulating sluggish livers. For dysmenorrhœa (painful menstruation) it may be taken three times daily for a week before the period commences.

GUINEA-WORM.—The guinea-worm derives its name from the Guinea coast of Africa where, as also in other tropical countries, it breeds in large numbers. The adult worms are found in man and cause a condition which is known as *dracontiasis*. The worms measure anything from 6 inches to 36 inches and are very slender creatures. The tiny embryo worms live in water, and human beings become infected through drinking contaminated water. The worms gradually work their way into the human tissues where they grow into adult worms. The adult female worm bores her way through the skin, usually on the arms or legs, and then she starts discharging her embryos on to the surface of the skin for about three weeks. Whenever the skin comes in contact with water, the embryos leave the surface of the skin and pass into the water, and thus the infection is carried on.

At the spot on the skin where the adult worm is working her way to the surface, a burning sensation may be felt and a blister usually forms. When this blister bursts, the head of the worm can be seen quite plainly below. The worm must not be extracted

until it has discharged all its embryos, as tearing of the worm at this stage may cause severe bodily poison to be set up. Cold water douched on to the opening will encourage the worm to discharge her embryos, and after about three weeks, when no more embryos are produced, the worm can then be extracted. This can be made easier by rolling the worm round a match, giving a turn to this every day until the tail, which is recognized by its hooked form, is reached. Care must be taken not to break the body of the worm while doing this. An operation can be carried out, if desired, in which the skin is incised and the worm removed, and the incised area disinfected with a solution of carbolic acid. (*See also* FILARIA; WORM.)

GULLET.—The gullet is the popular name for the ŒSOPHAGUS, and a full account will be found under that heading.

GUM.—Gum is a heavy sticky substance which is obtained from the trunks and branches of various trees. The two best-known gums used in medicine are gum acacia and gum tragacanth. Gums are used for throat lozenges as they are very soothing to inflamed surfaces. Gum acacia is most useful in cases of hæmorrhage, and it is given in the form of an injection in order to stop further bleeding.

GUMBOIL.—Gumboil or alveolar abscess is a condition in which the gum becomes very inflamed and swollen, usually as the result of an abscess at the root of a decayed tooth. If the health is in a very low state, a chill may cause inflammation and swelling to occur.

Symptoms.—Pain may be felt in the region of a decayed tooth, and matter usually collects at the root which gives rise to an abscess. The gum gradually thickens and is very painful, and in about two or three days' time the abscess may burst into the mouth, or it may even burst through on to the cheek.

Treatment.—It is better to have the abscess lanced or treated before it bursts of its own accord, and if the abscess is due to a decayed tooth or root, this matter should be attended to as soon as possible. Relief to the inflammation may be gained by the application of hot fomentations, or by painting the gum with tincture of iodine in the early stages. (*See also* ALVEOLAR ABSCESS; TEETH.)

GUMMA.—Gumma is the name given to a tumour which may appear on any part of the body as a result of syphilis. The tumour may cause no pain, but it may cause dangerous interference and pressure on some vital organ of the body. (*See also* SYPHILIS.)

GUMS, DISEASES OF.—Diseases of the gums usually occur through infection or as a result of irritation. Too vigorous and too frequent use of a hard tooth-brush may cause the gums to recede, especially on the canine and more prominent teeth. Ulcers may form on the gums as a result of a badly fitting dental plate. This matter can be quickly cleared up by a visit to the dentist in order to have the plate adjusted. Small ulcers or sore spots may appear on the gums or surrounding tissues owing to some disturbance of the digestion. These usually clear up in a day or two, but the mouth should be kept clean with an antiseptic mouth-wash. Gingivitis is a state of inflammation of the gums which is due to infection or irritation. Pyorrhœa is one of the most important diseases of the gums and it is a condition in which large quantities of pus are found in the sockets of the teeth. The general health should be attended to and a visit to the dentist must be made. Antiseptic mouth-washes should be used frequently. If the gums are soft and spongy, a daily massage with the fingers will encourage the circulation and improve their condition. (*See also* DENTAL DRILL; GINGIVITIS; GUMBOIL; PYORRHŒA.)

GUNSHOT WOUNDS.—By gunshot wounds we usually mean all the injuries caused by explosive weapons, such as guns, revolvers, shells, bombs. The immediate treatment is nearly always a question of first aid so it is given in the SPECIAL SUPPLEMENT ON FIRST AID.

GYMNASTICS.—The old meaning of gymnastics used to be to exercise in a naked state, but nowadays it is applied to the use of physical exercises for the purpose of developing the body in which it is necessary to use special apparatus or appliances. The whole subject of exercise is dealt with in the SUPPLEMENT ON EXERCISE. A special group of gymnastics for the purpose of curing various deformities and weaknesses is called remedial gymnastics. These will be found under the heading REMEDIAL EXERCISES.

GYNÆCOLOGY.—The study of the diseases of women, especially those affecting the sexual organs, is known as gynæcology, from a Greek word *gunē* meaning a woman.

HABIT.—When any action has been performed several times it becomes easier to carry out, and if it is continued becomes so easy that the nerves and muscles used in carrying out the action do so with very little prompting from the person's own conscious will. He may, in fact, not know that he is performing the action until it is nearly, or quite, completed. The action has then become "habitual" and a "habit" has been formed. This habit-forming ability of ours is of the greatest use to human beings, as it eases the burden on the hard-working executive part of our minds and leaves it free to carry out new and unaccustomed actions.

A large part of our general education is aimed at forming good habits to ease our way through life. The difference between a good craftsman and a bad one is largely the difference in the proportion of his work that has become habitual to him, leaving him with extra brain power to devote to improvement in the task. Good habits, therefore, must be diligently acquired if we are to be successful in life, but it is just as important not to acquire bad habits. Whereas a good habit saves mental and physical energy, a bad habit wastes it. People easily become slaves to their bad habits and find themselves ruled by habit, instead of making habit their handmaiden. There is a type of person in whom the habit-forming power is so strong that if the same action is performed only two or three times it becomes a strong habit. These people are often very difficult to live with, and their mannerisms may drive their families almost frantic. These are the people who hum or whistle, who suck their teeth or sniff, and acquire all sorts of personal bad habits ranging from nail-biting to bad "tics." All this sort of thing has begun from allowing the action to be performed without pulling oneself up sharply in the beginning, until in many cases the habit has become so much a part of the person that it is an almost impossible task to cure it.

In the field of health good habit-forming should be begun in the very earliest days of the child's life. It is most important that the working of the bowels, bladder and the digestive system should be early brought under our automatic control, by the foundation of good habits. Sleep, too, is largely a matter of habit, and the habit of sleeping the minute the head is put on the pillow is one of the most valuable possessions a hard-working man or woman can have. For this reason the sleep of the child should be safeguarded by all possible means, and it should be a rule never to disturb a child once its head is on the pillow. Visitors who want to peep at it should be sternly repressed, because if a child has firmly acquired the habit of rapid and sound sleep, it will, with ordinary luck, be able to keep it all its life, and will be able to face each day a refreshed and renewed person.

The wise person will try to lay in a good equipment of useful, labour-saving habits on his journey through life, and will pull himself up sharply when he finds himself drifting into wasteful and bad habits.

Habit Spasms.—Many people, especially young children, have irregular muscular movements which affect different parts of the body, such as jerking the head about, twitching the shoulders, flickerings of the eyelids, grimacing, frowning, etc. These movements are performed unconsciously, but are under the control of the person since they can be immediately stopped if the person's attention is drawn to them, and they never take place during sleep. The cure for these spasms, which are really only bad habits, is for the person himself to be on the lookout for them and avoid them, or in the case of a child, careful and kindly training by the parents or teachers. It is not the slightest use using harsh measures and scolding—because the movements invariably become worse when the person is in an emotional state.

At first sight it is not easy to decide whether the twitchings and jerkings and fidgetings of childhood are purely bad habits or whether they are due to the illness called St. Vitus's Dance or chorea, in which case the child needs careful medical attention and nursing in order to save it from invalidism in the future. The nervous condition called "tic" must also be looked out for. (*See also* FIDGETS; ST. VITUS'S DANCE; TIC.)

HÆMATEMESIS. — Hæmatemesis literally means vomiting of blood. Bleeding may occur in the stomach as a result of acute gastritis, cancer, or as a symptom of ulcer of the stomach. It may also occur in certain

diseases of the blood such as hæmophilia, purpura and severe anæmia. If the hæmatemesis is severe, the patient usually has a feeling of faintness and nausea, and then vomits up the blood. Blood brought up in this way is generally dark in colour and may have the actual appearance of coffee grounds. It should be remembered that blood may be swallowed from the nose or throat, and there is also the possibility of blood being swallowed from the lungs. (*See also* HÆMORRHAGE.)

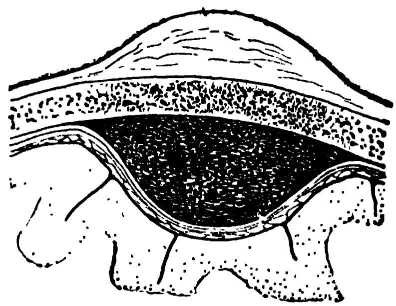
HÆMATINURIA.—The presence of blood in the urine is known as hæmatinuria and it is an indication of disease of the blood, or of the kidneys, or bladder. (*See also* BLADDER; BLOOD; KIDNEY; URINE.)

HÆMATOCELE.—The collection of blood in a cavity of the body, especially in the pelvic cavity in females or in the testicle in males, is known as hæmatocele.

HÆMATOMA.—A tumour or swelling containing blood is known as a hæmatoma. It may be the result of some injury, and it is very commonly found on the head of a newborn child after a long and difficult labour. Hæmatoma, or swellings caused by an effusion of blood, occur very frequently on the ears of insane persons, usually as the result of slight injuries or through changes in the tissues. At first a hæmatoma is rather soft to the touch, but it gradually becomes harder as the blood clots. In the course of a month or two, the whole contents of the swelling may be absorbed into the surrounding tissues and no treatment may be required. If there is any pain accompanying the swelling, cold applications will give relief. In some cases, the swelling may become infected and an abscess may form. This should be opened as soon as any pus begins to collect.

HÆMATURIA.—This term signifies the passing of red blood corpuscles in the urine. *Nephritis* (Bright's disease) is one of the commonest causes of this condition, but it may result from stones, inflammation, or growths in the bladder. In tropical countries the passing of blood in the urine may be a symptom of *bilharziasis*, a disease caused by worms. If the blood is thoroughly mixed with the urine on passing, it is probably coming from the kidneys; if the blood appears only at the beginning of the flow it probably comes from the urethra, and if it is noticed at the end, the site of the bleeding may be the bladder. The colour of the urine depends on how much blood is passed. In some cases, if there is a large amount of blood present, the urine may be almost black or may present a smoky appearance. With small amounts it may be only faintly tinged, or may present no change at all to the naked eye. In certain cases the presence of the blood cells can only be recognized under a microscope, or by having the urine tested with chemicals. (*See also* BLADDER; KIDNEY; URINE.)

HÆMOCYTOMETER.—This is an instrument for counting the number of corpuscles present in the blood. This information is very valuable to the doctor as it gives him an indication whether or not his patient is suffering from anæmia. (*See also* ANÆMIA; BLOOD; CORPUSCLES.)



Hæmatoma

HÆMOGLOBIN.—Hæmoglobin is the colouring matter in the red corpuscles which produces the red colour of blood. People who suffer from anæmia are pale because of the absence of hæmoglobin in the blood. (*See also* ANÆMIA; BLOOD.)

HÆMOPHILIA.—This is the medical term for bleeder's disease. It is a condition in which the blood does not clot in the normal time, and the patient may bleed to death unless special precautions are taken. This disease is a hereditary one, and it is confined almost entirely to the male members of the family though it is transmitted through the mother. (*See also* BLEEDER'S DISEASE.)

HÆMOPTYSIS.—Hæmoptysis, or the spitting of blood, is a condition which may be due to various causes; but the most frequent cause, by far, is tuberculosis of the lungs, especially when the blood is in any quantity. Another fairly frequent cause is

disease of the mitral valve of the heart, which causes the lungs to be "waterlogged" with blood. Any other causes (growths in the lung, severe anæmia, etc.) are very rare. While the nose may bleed into the throat, and the blood be coughed up, it is usually a mistake to blame blood-vessels in the throat for bleeding; the blood is much more likely to have come from the lung. Bleeding which comes from the throat, mouth or nose is termed spurious hæmoptysis, whereas blood which comes from anywhere below the larynx is termed true hæmoptysis. (*See also* TUBERCULOSIS.)

HÆMORRHAGE.—By hæmorrhage is meant bleeding of any description from any part of the body, but for general purposes most people use the word bleeding for small losses of blood such as that from a cut finger, and hæmorrhage for a larger flow. The bleeding may be either external or internal. In external bleeding the blood penetrates through the skin, or gathers visibly just under the skin and is plain to see with the naked eye. In internal bleeding, however, there may be nothing showing which an unskilled person would recognize as blood. The blood will be coming from some part of the interior of the body and will eventually be given off in the stool or urine, but in such an altered form that it bears no resemblance to the bright red fluid we call blood. This is called *occult blood*, meaning hidden blood. It is common in ulcerated conditions of the stomach or intestines, and if it is present in such large quantities that it darkens the colour of the stools it is known as *melæna*.

External bleeding may be from veins, arteries or capillaries.

Treatment.—In the case of very small cuts and scratches, the pressure of a bandage will usually be all that is required to stop the bleeding. All profuse bleeding rapidly becomes a serious matter, so the subject is dealt with in detail in the supplement on common emergencies and their First Aid treatment. In this connection it may be remarked that the time to use a first aid supplement or manual is not so much when the emergency has occurred as in the peaceful times beforehand, when the few simple devices that will save life should be memorized and practised in preparation for the moment when the knowledge of just what to do and how to do it will possibly make the difference between life and death. The first thing to do when bleeding occurs is always to put pressure on the wound. If it is small and the finger will cover it, press hard with the finger. If it is larger, the proper pressure will have to be applied by tight bandaging by means of a *tourniquet*, or by pressure on the right spot on the damaged blood-vessel. These "pressure points" are important and are fully described in the supplement. Applying either very cold water or very hot water may stop hæmorrhage, but lukewarm water will probably increase it.

Internal hæmorrhage will be recognized by the condition of the patient before the blood appears in the stools. A person bleeding internally becomes cold with clammy skin, pale lips and finger nails, quick and feeble pulse, quickened breathing and sometimes breathlessness. There is usually great restlessness, a very anxious and drawn look on the face, and the patient may say that he feels his life ebbing away from him. Obviously the condition is dangerous and the bleeding must be stopped by skilled attention as soon as possible, and after the bleeding has been stopped means must be taken to restore the vitality of the patient. It is now considered that death from bleeding is most often due to the fact that the heart cannot work properly without a certain amount of fluid in the blood-vessels, so the first thing to be done after a bad hæmorrhage is to restore the proper amount of fluid to the blood-vessels, so that the heart will be able to continue its rhythmical pumping. The methods by which this fluid is supplied are as follows. In a very urgent case, the doctor may inject a quantity of the salt solution *normal saline* straight into a vein, or it may be injected into the tissues under the skin in some fleshy part of the body. In less urgent cases the saline may be injected into the bowel to be retained there, or the patient may be given large quantities of warm fluids to drink.

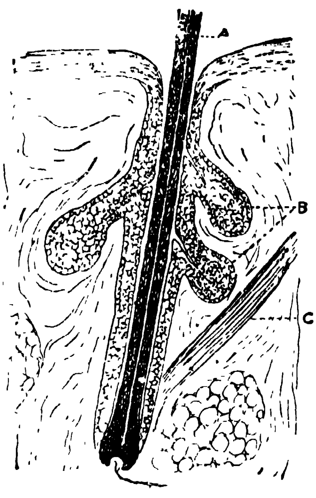
In surgical operations it is, of course, necessary for the surgeon to cut through several at least of the smaller blood-vessels, and he will stop the bleeding from these vessels by tying their ends with ligatures or closing them with artery forceps. Bleeding from the lungs is bright red, frothy and is coughed up. Blood from the stomach is

darker in colour and is usually compared to coffee-grounds. It is vomited up. In both cases the patient must lie down and be kept quiet until a doctor is fetched. For the emergency treatment of bleeding and a more detailed account of pressure spots, etc., *see* the First Aid Supplement. (*See also* Blood; Tourniquet.)

HÆMORRHOIDS.—The name commonly used for hæmorrhoids is *piles*, and the condition is fully described under that heading. By piles we mean a condition in which the blood-vessels at the lower entrance to the bowel are dilated and cause pain and discomfort. (*See also* Constipation; Piles; Remedial Exercises.)

HAIR, THE.—A hair is formed from elongated horny cells arising from the epidermis or outer layer of the skin, and grows from a tube in the skin called a hair follicle. It has a root and a shaft, which is rounded in straight hair, oval in curly hair, and varies greatly in thickness. The surface of each hair is covered with scales, arranged in over-lapping fashion like tiles on a roof. The colour of the hair is due to the varying amount of colouring matter in its substance. White hair occurs when numerous air-spaces form in its cells. The root of the hair ends in a dented knob; into this dent fits the papilla, which is a little knot of blood-vessels. This nourishes the hair, and without it the hair dies. The root is the growing point of the hair, the rate of growth being about six inches in a year. The follicle runs at an angle into the skin, so that the hair has a natural slope; this is best seen in an animal's hairy "coat." Its use is to turn the rain.

In the true skin are small muscle fibres connected with the roots of the hairs; contraction of these, as from cold or fear, causes the hair to stand on end, and produces "goose flesh." This is well seen when a kitten is frightened. The hair is kept glossy by the oil from the sebaceous glands, which open into the follicle. Each gland looks like a tiny bunch of grapes.



Hair:
—Hair; B—Sebaceous Glands; C—Muscle (erector pili)

Long hair sometimes splits at the ends, or forms greyish pointed nodules ("beaded hair"), at which the shaft kinks and finally breaks off. These conditions are due to brittleness, and are caused by removal of the natural oil by washing with coarse soaps, drying by heat, etc. (*See also* Hair, Superfluous; and Beauty Culture Supplement.)

HAIR, SUPERFLUOUS, or HIRSUTIES.—This condition, also known as Hypertrichosis, occurs when an abnormal growth of hair is present. It is present in both sexes, varying from a downy moustache in a lady to—in a few cases—a shaggy pelt of hair covering the whole body. Such people have been given the name "hommes-chiens" (dog-men), and are occasionally exhibited in travelling shows, etc. The cause of the condition is unknown; repeated greasy applications, and a naturally greasy skin, strengthen the growth.

Practically speaking, it is women alone who seek treatment, the parts affected being the armpits, the forearm and legs, and especially the beard and moustache region. Formerly, physicians thought it beneath their dignity to treat cosmetic blemishes, but it is now realized what real mental suffering these cause, and much attention is devoted to them. The "home" methods of removal by shaving, depilatories, singeing, etc., are fully discussed elsewhere (*see* Beauty Culture: Superfluous Hair); the medical methods are electrolysis, X-rays, and "punching." In electrolysis the papilla or growth-point of each hair is destroyed by an electric needle. This requires time and patience, especially where the growth is heavy, but is very successful in expert hands. X-rays are no longer regarded with favour; it is found that some years after "successful" treatment the skin degenerates, and numerous red veins form upon it, the result

being very disfiguring. "Punching" is only suitable for isolated stiff hairs, but is often used together with electrolysis.

HALIBUT.—The halibut has become a fish of primary importance in medicine and dietetics since the recent discovery that its liver contains Vitamin D in far greater proportions than does the liver of the cod. Halibut-liver oil is now being used for the same conditions as cod-liver oil. (*See also* COD-LIVER OIL; SUPPLEMENT ON DIET; VITAMINS.)

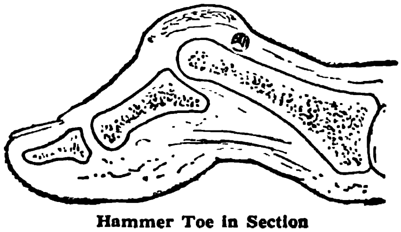
HALITOSIS or BAD BREATH.—The word halitosis means a foul breath. This condition may be due to numerous causes, most commonly septic tonsils or decaying teeth. Diseases in the nose and throat may bring about a state of foul breath; also constipation, dyspepsia, or the eating of certain foods may be responsible. (*See also* BREATH, OFFENSIVE.)

HALLUCINATION is an imaginary sensation, either of sight or of hearing, or rarely, of smell; that is, the person who has an hallucination sees, hears, or smells things which have no existence. Hallucinations occur in many disorders of the mind, and are mainly of two types, pleasant and unpleasant. When they are unpleasant, as in delirium of all kinds, including *delirium tremens*, they cause much apparent terror to the patient and much distress to those who witness his fears, but on recovery, nothing is ever remembered of the hallucinations; they are "blotted out" and should not be referred to by the patient's relatives. Pleasant hallucinations occur mainly in that form of mental trouble known as *dementia præcox*, and they are very often hallucinations of hearing which cause the patients to withdraw more and more into themselves in order to be free to indulge in listening to the voices. Imaginary voices, which tell patients that they are being persecuted, and must slay their enemies are common in *delusional insanity*. (*See also* DELIRIUM TREMENS; INSANITY; MENTAL DISEASE.)

HALLUX VALGUS.—The medical name for the great toe is hallux, and hallux valgus is a condition chiefly found in growing children in which the big toe is displaced and lies either above or below the second toe. It is due to ill-fitting shoes, especially the wearing of pointed toes to the shoes at an age when the bones of the feet are still impressionable. When hallux valgus occurs it almost always forms the starting-point of other foot troubles. The joint of the big toe usually acquires a bunion, and corns and callosities are almost always formed. The joint of the toe may become stiff, inflamed and painful.

Treatment.—It is far better to prevent the formation of avoidable deformities of the feet such as hallux valgus than to rely upon treating them when they have arisen. Properly shaped shoes in childhood and youth are the very best preventive for such conditions. The child's foot is naturally almost a straight line from heel to the tip of the big toe in unspoilt feet, but it has become popular to consider this "line" ugly, and for generations people have tried to compress their toes into a type of shoe in which the toe room corresponds roughly in amount with the heel room. and the big toe is treated as if it were the middle toe instead of the outside one. When it is noticed that the child's toe is bending inwards place a wad of cotton-wool or a little spool-shaped plug made of rubber, which is sold for the purpose, between the big toe and the second toe inside the stocking. Continued wearing of this will do much to straighten out the toes provided that the shoes are roomy enough at the toes. If the toe does not straighten it may be necessary to have a special shoe made with a little partition which will separate the great toe from its neighbour.

In adults operation is the only real cure, but separating the toes and massage and exercises will help a lot to keep the condition from getting worse. Walking on tiptoes with bare feet and the toes turned in is a useful exercise that can be practised for a short time daily whilst dressing and undressing or at any odd moment, or place the pad



Hammer Toe in Section

between the toes and rise to the tiptoes a dozen times in succession, increasing the number as it becomes easier.

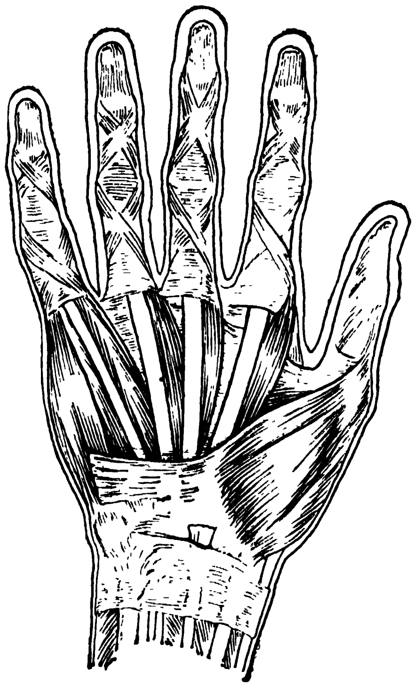
HAMMER TOE.—Hammer toe is a condition in which one or more of the toes is bent

into the shape of an inverted V. The top of the Λ usually presses against the toecap of the shoe and causes much distress and pain. It generally happens that a corn develops on the crown of the V and others may form beneath the toe where it presses on the ground. This deformity is usually caused by wearing badly-shaped shoes.

In some cases the toe may be straightened by the use of a splint, but this form of treatment is uncomfortable and may take a long time. A slight operation on the toe may be necessary to bring it down into line with the other toes. (*See also* Boots and Shoes.)

HAMSTRINGS.—The tendons situated at the back of the knee on the outer and inner sides are termed the hamstrings. Their action is to bend the knee and to enable the foot to turn inwards and outwards. (*See also* Knee.)

HAND.—The hand in the human being is a very highly specialized tool, and therein lies one of the greatest differences between human beings and animals. Even the cleverest ape has not the delicate sense of touch and the ability to control the movements of the hand that the human being, even the child, has. The difference lies in the brain which has for innumerable generations supervised the training of our fingers and hands until they are now the means by which the vast majority of us earn our daily bread. It will be realized, therefore, that we must take great care of our hands. Placed as they are in a conspicuous position at the ends of the arms they are liable to accidents, and small cuts and knocks are almost a daily occurrence. Any sign of inflammation must be attended to at once and it is especially necessary to take measures to keep dirt and germs away by means of a small bandage, fingerstall, etc.



Hand: Tendons and Muscles of the Fingers

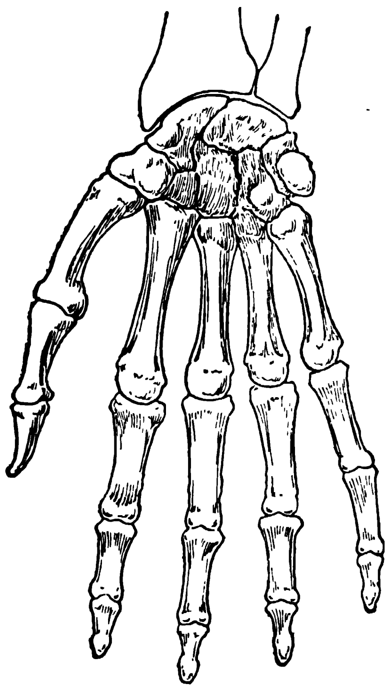
Structure of the Hand.—The hand is hinged on to the forearm by the joint called the wrist joint, by means of which it can move up and down, and from side to side. The normal hand turns easily from the position in which it is palm upwards to the position in which the palm faces downwards; it should also bend either up or down to the position of a right angle. With the hand held out with the palm facing the ground, it will be seen that the fingers can only be moved slightly upwards, but should bend downwards at right angles. They should be able to rotate with a complete circular movement, all except the ring finger which has not a very complete range of movement. The tips of any or all of the fingers can be brought together, thus the normal hand has as full a range of movement as can be desired for any ordinary purpose. It is very important for many types of work to preserve this complete range of movement, hence the great importance of taking steps to avoid poisoning in the hand and crippling diseases like rheumatoid arthritis. Insurance companies recognize the importance of the hand by usually insisting that even small accidents to the hand shall be inspected by a specially qualified orthopædic surgeon.

Skeleton of the hand.—The main bones of the hand are the five metacarpal bones situated in the palm of the hand and connecting the wrist bones with the finger bones. Each metacarpal bone is jointed on to a finger which consists of three small bones called the *phalanges*, except the thumb which has only two phalanges. Three principal nerves, the ulnar, median and radial, supply the hand and divide into a network of small branches radiating to the fingers. The veins on the back of the hand, which are so

superficially placed that they can often be easily seen, are tributaries of the basilic and cephalic veins. The hand is well supplied with muscles and tendons which carry out the various movements of the hand.

The care of the skin of the hands is dealt with separately in the SPECIAL SUPPLEMENT ON BEAUTY CULTURE.

HANGNAIL.—This unsightly and somewhat painful condition is caused by neglect. If the cuticle (the fine skin at the base of the nails) is not pushed back regularly, and in



Bones of the Right Hand—Palmar Aspect

consequence overgrows, the skin will tear and in places become detached, forming hangnails.

If regular care is given the condition will not occur; but if hangnails form, they should be cut off with fine scissors, the small wound touched with a caustic stick, and covered with court plaster. A neglected hangnail has been known not only to give rise to local infection ("a poisoned finger"), but even to generalized blood-poisoning.

HARE-LIP.—It sometimes happens that a baby is born with the two halves of its upper lip not joined together, and this is called a hare-lip from its resemblance to the split lip of a hare. In the embryo the upper lip develops in three pieces: two side flaps and a middle strip, and the join in these parts—which normally takes place before birth—is represented in our faces by the two raised lines on each side of the furrow in the middle of the upper lip. Sometimes both side pieces of the lip fail to join up before the birth of the baby, but more often it is one side only. When hare-lip occurs it is usual to leave it alone for the first few weeks until the baby has learnt to suck, then an operation is performed to join the two parts of the lip. In the great majority of cases the operation is completely successful and very little trace of the defect can be seen in after life.

HARROGATE.—Harrogate is not only famous as one of the leading spas of Great Britain, but, situated as it is high up on the edge of the Yorkshire Moors, it is an important health resort on account of its bracing climate. One of the outstanding features of this spa is the great variety of its waters, but its sulphur and iron springs form the two main springs. There are as many as eighty-eight groups arising within a radius of two miles, sixteen of which are used for drinking purposes. The salt and sulphur waters are the most famous of all the spa waters, and they are particularly beneficial in the treatment of obesity and disorders of the liver, especially those resulting from too rich a diet combined with an excess of alcohol. They are also of service in the treatment of gout, chronic rheumatic arthritis, muscular rheumatism, and certain skin diseases. This salt and sulphur water can be had in very concentrated form from the Old Sulphur Well and the Strong Montpellier Well. It is usual for those taking treatment to drink half a pint to one pint of this water at the Royal Pump Room, an hour before breakfast. Within an hour or so there should be one or two actions of the bowel which are partially or wholly fluid and perfectly painless. The whole system should feel braced up, and it is usual for this feeling of well-being to last throughout the day.

The salt-iron waters have the reputation of strengthening the blood, both during and after treatment, and they are also good for stimulating the action of the kidneys. The pure iron springs are particularly suitable for administration to delicate and anæmic children, and the water, when aerated, is

quite palatable even to those who find difficulty in taking the usual iron preparations. The Tewit Well, in particular, has always had a great reputation for the value of its water.

The Harrogate Royal Baths.—The Royal Baths, where all the treatments are now carried out, are up to date in every way, and every approved form of bath can be obtained. The salt-sulphur baths increase and stimulate the action of the skin and, owing to the invigorating and antiseptic properties of the water, they are especially beneficial in the treatment of chronic eczema and other skin diseases. This type of bath is also given to relieve congestion in the internal organs, particularly in cases of congestion of the liver. In painful conditions such as sciatica, lumbago, or arthritis, remarkable relief is derived from what is known as the undercurrent douche used while the patient is immersed in the sulphur bath.

The peat of the neighbouring moors is made use of, and various types of peat baths may be had which are found particularly soothing to the nervous system. Foam baths, which produce an active effect on the surface of the skin, are given on the same principles as the Nauheim baths. Given at high temperatures as a sweating bath, they are beneficial in the treatment of rheumatism in the joints and muscles. Harrogate has no naturally aerated waters, but effervescent baths are created artificially by the addition of sodium bicarbonate and hydrochloric acid. This type of bath is excellent for those suffering from heart conditions.

Three weeks is the length of time considered sufficient for a cure, but patients suffering from chronic complaints may require longer time to obtain the full benefit from the treatments. Owing to the fact that Harrogate is situated from 350 to 600 feet above sea level, the air is particularly bracing, and the town is well guarded from the rain-laden winds of the Atlantic by the Pennine Range. (*See also* BATHS.)



View of the Royal Baths, Harrogate

HARTSHORN.—A liniment known as oil of hartshorn is made up of a solution of ammonia and almond oil. It is used in the treatment of bronchitis and cold in the chest. Rubbed into the chest it gives the patient a feeling of warmth and comfort, and the inhalation of the fumes of the ammonia helps to clear the head and air passages. In cases of rheumatism, rubbing the parts with this liniment may give relief. Not only does the ammonia have a warming action on the skin, but the massage necessary

to rubbing the liniment into the skin, is very beneficial indeed.

The name hartshorn is really an old term for ammonia, as ammonia was, at one time, extracted from the horns or antlers of harts or stags. (*See also* AMMONIA.)

HARVEST MITE.—These little mites have many names, but the most popular ones are the harvest bug, the mower's mite, and the bête rouge. They have eight legs, while their young have only six. The adult mites are vegetarians and are to be found on gooseberry bushes, grass and other vegetation. The young burrow into the skin of human beings, particularly the ankles, arms and neck, and set up great irritation. They are very tiny creatures, bright red in colour, whence they derive the name of bête rouge. Later on, these young harvest mites leave the skin of the human being or animal they have invaded and develop into eight-legged vegetarians.

Symptoms.—The harvest mites do not suck the blood but they cause great irritation and itching on the skin. By scratching the skin further irritation is set up, which may result in a severe attack of dermatitis.

Treatment.—Sponging the affected parts with weak ammonia will help to relieve the irritation, especially if zinc ointment is applied freely after the skin has been carefully dried. An application of petrol or benzine will kill the harvest mite, but care must be taken not to place these substances near fire or a naked light. (*See also* DERMATITIS.)

HASHISH.—Hashish or *cannabis indica* is a drug which is used a great deal in the East to produce pleasurable symptoms. When taken to excess it is very dangerous and may lead to great depression and insanity. Other names for this drug are *ganga*, which is obtained from the dried flowering tops of the cultivated plants; *charas*, which is obtained from the resin scraped off the leaves, and *bhang*, which is the dried leaves. *Ganga* and *charas* are often smoked like tobacco. (*See also* CANNABIS INDICA.)

HAVERSIAN CANALS.—These are little canals that run through the substance of bone. Their course is usually the direction of the bone and they branch freely and join into each other. Each little channel contains minute blood-vessels and nerves which are thus distributed throughout the bones, and it is these tiny blood-vessels which cause a bone to bleed when it is broken. When inflammation or pressure in the bone causes these little vessels to be blocked up the bone will be robbed of its food and will die, or become necrosed as it is called. (*See also* BONE.)

HAY FEVER.—Hay fever is a distressing condition which comes on regularly every summer in certain people and whilst it lasts, which is usually the whole of the summer, renders their lives miserable. It is one of the diseases which are now called "allergic diseases" in which things that would not hurt the ordinary person act as poisons to some people and bring on severe symptoms. The other allergic diseases are asthma and urticaria.

Symptoms.—The symptoms of hay fever come on with great regularity in the early summer each year. They resemble a cold in the head of varying severity, sometimes there is just itching of the eyes and running of the nose but often there are severe attacks of sneezing, great swelling of the eyes and severe nasal catarrh, asthma or breathlessness and the patient may become quite ill, even running a temperature. Hay fever is always worse in the country than in town-dwellers, and it has been found that the pollen of several sorts of grass cause it in susceptible people, the most serious one being Timothy grass.

Predisposition to Hay Fever.—People who develop hay fever usually come from a family where there is a history of nervous sensitiveness, and it will usually be found that other members of the family suffer from skin troubles such as urticaria, or are asthmatic. All these sorts of people are abnormally sensitive to the introduction of any unusual substance into their systems, and great care must be taken when giving them injections of serums or drugs in case too severe a reaction is caused.

Treatment.—A great deal can now be done in the way of treatment for people with hay fever. The first step is to discover what pollen is to blame and this is done by a simple test. A small amount of an extract of the suspected pollen is dropped into the patient's eye, or extracts of various pollens are rubbed into little scratches on the arm. The pollen which is harmful to the patient will cause a little inflammation. Having discovered which pollen is causing the hay fever it is necessary to try to render the

patient less susceptible to it by injecting an extract of it in small doses into his bloodstream. This injection treatment must be begun well in advance of the hay-fever season or it will not be able to protect the patient. The usual month to begin is March or April. These courses of injections will have to be continued each year, but usually the patient grows out of the tendency to a great extent.

When an attack occurs there are various remedies that may be used to settle it down. A spray containing a mixture of adrenaline and chloretone may be used, or a soothing ointment may be used inside the nose. Some people are benefited by taking glucose or calcium, or both. Ephedrine locally or internally is a useful new remedy, and some people obtain benefit by slight cauterization or by copper ionization of the nasal passages.

HEAD.—The head consists of the skull, or cranium, and the face. The skull contains the brain, which controls the nervous activity of the body. The face contains the organs of sight (eye), smell (nose), taste (tongue), hearing (ear). In animals the sense of touch is also largely situated in the face, but in human beings it has been almost entirely transferred to the hands.

The bony framework of the head consists of the rounded dome of bone called the cranium, with the attached cheekbones and jawbones. The nose is largely made of cartilage, and the ears are made of cartilage and small bones. At the base of the back of the head are two projections called condyles, which serve as pegs to attach the head to the backbone. On these pegs the head can turn from side to side and move backwards and forwards.

Certain of the bones in the head contain air cavities which are called sinuses. These communicate with the nose and are the means by which resonance is given to the voice. They can be the seat of infection which has spread from the nose and which gives rise to a painful and dangerous condition called sinusitis.

The shape of the head varies in different people, but as a rule people of the same nationality have similarly shaped heads, as for example the square heads of the Teutons. People have often tried to tell fortunes and characters from the shape of the head and the protuberances on it; but phrenology, as this is called, has remained a pursuit for amusement rather than a science.

Several diseases alter the shape of the bones of the head. Of these the most important are acromegaly, rickets, and osteitis deformans.

HEADACHE.—Headache is a complaint to which everyone is subject at some time or other, but some people suffer from it to a much greater extent than others. The causes of headache are very numerous, and vary from slight indispositions in some part of the body to severe mental or physical disease. Almost any upset in any part of the body can have headache for a symptom, and people use many different terms, words to describe their headaches, such as stabbing, aching, nagging, throbbing, boring, nails being driven into the head, or tight bands being tied round the head.

Headaches in Children.—When a child complains of headache it is as well to take his temperature at once, because headache is usually the first symptom of any of the infectious fevers such as measles, scarlet fever or influenza. If there is no temperature the most likely causes are costiveness or eye strain. If the headache is very severe the child should be taken at once to a doctor to be examined in case it is the beginning of some severe trouble such as meningitis or mastoiditis.

Headaches in Adults are very common. Some people get a headache in heavy muggy weather and can always foretell the approach of a thunderstorm by the appearance of a headache. Many women have a severe headache of the variety known as a "sick headache" each month. Other people get a severe headache when they go too long without food and the headache clears up immediately a few mouthfuls of food are taken. The severe attacks of sick headache known as migraine, or the megrims, appear to be constitutional and hereditary. They are described in a separate article. A very common cause of persistent headaches is a fault in the eyesight which is not being corrected by wearing the proper glasses. Defective teeth, and nose and throat troubles are also very frequent causes of headache. Stomach, liver, heart and kidney diseases all give rise to severe headaches. Nervous diseases such as hysteria, neurasthenia, etc., headache is usually a troublesome symptom.

Any feverish attack such as influenza, malaria, etc., usually starts with severe headache. The type of headache which might be described as a severe pain in the head rather than ache may be the result of some injury or disease of the brain itself. Neuralgia and rheumatism sometimes cause pain which is definitely felt in the head.

Treatment.—It will be seen from the list of causes given above that obviously the first thing to do towards the cure of headache is to find out its cause and clear up any underlying disease that may be causing it. Many of the simple passing headaches to which people are subject will disappear with quite simple treatment. An aperient pill at night with a drink of health salts in the morning will usually clear up a "bilious" headache. There are many excellent remedies to be bought for the simple headache, such as phenacetin, aspirin, antifebrin, antikamnia, phenazon, pyramidon and others. Some suit one person and some another; but when such a drug is taken it will always act better if the person lies down in a darkened room and tries to sleep while the drug is taking its effect. It is often useful to combine caffein with one of the above drugs because of the depressing effect they often have on the patient. If the headache is combined with excitability a tablet of the three bromides may be useful. (*See also* MIGRAINE.)

HEAD LOUSE or PEDICULUS CAPITIS.—Head lice are little grey creatures with a black line at the outer edge of the body. They are found chiefly in the heads of dirty people. The eggs of the louse are known as *nits*, and these are white in colour and cling firmly to the hair. One louse may lay as many as fifty or sixty eggs. These are very often mistaken for scurf, but closer inspection shows that scurf does not cling to the hair in the same way as do the nits.

The lice cause considerable irritation to the scalp which is called *pediculosis* and the scratching which follows very often sets up unpleasant skin troubles. Infection may be carried to the scalp through broken parts of the skin, and it is also known that infectious diseases can be transmitted from one person to another by means of head lice.

Absolute cleanliness is the only way to keep free of these creatures once they have been found in the head. The hair should be washed at least twice a week and careful inspection should be carried out. Children at school should be given particular attention to see if lice or nits are present. Applying paraffin oil to the head is the simplest way of killing the lice. This should be well rubbed into the head at night and left on for about ten hours. A bathing-cap worn over the head will avoid soiling the pillows. This operation should be carried out the following morning and evening, then the morning after that the hair should be thoroughly washed with soap and water. Soaking the hair in equal parts of vinegar and water is an excellent way of loosening the nits which then can be removed by means of a small-toothed comb. Another remedy is oil of sassafras which is used extensively for the destruction of lice and their nits. This should be applied to the hair and left on for about twenty-four hours. Any irritation on the scalp should be treated with olive oil or some soothing ointment. All combs, brushes, and caps should be disinfected before using again. This can be done by putting about a teaspoonful of lysol to each pint of water and soaking everything well before washing with soapy water.

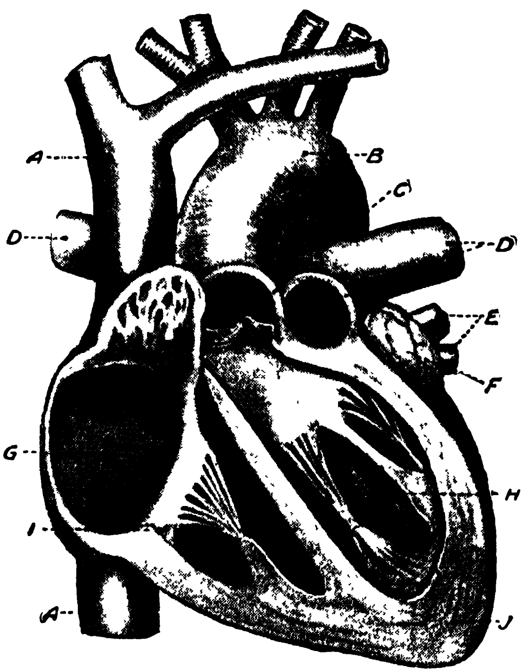
HEALTH.—When a person is enjoying good health, it is an indication that all the various parts of the body are working in good order and the mental state is such that there is no feeling of strain or discomfort in carrying out the daily work. Of course, there are various degrees of good health. Some days one may feel particularly energetic, the appetite is keen, and the body responds to any task without the slightest effort. This high pitch is very often reached by young people; but, unfortunately, not so often in older people. Perhaps as we get older we get lazier, and the mental effort necessary to urge our bodies to a state of better health is not made. There is no doubt that the state of our mind has a great deal to do with the state of our body, and it is dangerous to allow a depressed state to get too firm a grip on us and depress our physical health. For the greatest enjoyment of life and usefulness to our fellow-beings, there is nothing for which we should be more grateful than for a healthy mind in a healthy body.

HEALTH RESORTS.—Health resorts are really places to which people are accustomed to go in search of health, and in this respect

all seaside places are health resorts. It is more usual, however, to use the term health resorts for places inland or at the seaside where special efforts are made to cater for invalids and people who desire a certain sort of healthful holiday, either restful or tonic. Chief of the health resorts are the spas which have special elaborate equipment for treating people with the medicated waters in their neighbourhood and other health treatments, such as electricity, sunlight, etc. Of these the two chief in the British Isles are Bath and Harrogate. Other well-known spas are Buxton, Droitwich, Cheltenham, Leamington, Llandrindod Wells, Trefriw, Matlock, Malvern, Ilkley, Builth Wells, Bridge of Allan, Strathpeffer, and Woodhall Spa. The waters at these places are of different sorts. Some are alkaline, whilst others contain brine, sulphur, calcium or iron. Other health resorts are popular for their bracing mountain air, such as Malvern, Pitlochry, Buxton, etc Among the chief seaside health resorts in England are Brighton, Margate, Ramsgate, Bognor Regis, Worthing, Bournemouth, Weymouth, Torquay, Weston-super-Mare, Southport, Blackpool, Morecambe, Scarborough, Skegness, Cromer and Felixstowe. Most of these places have a bracing climate, though Torquay, Bournemouth and Bognor Regis are rather more relaxing than the others.

HEARING.—The sense by which the sound vibrations of the air are conveyed to our brains is known as hearing. The ear is the organ of hearing, whence the vibrations are carried by the auditory nerve to our brains. (*See also* DEAFNESS; EAR.)

HEART.—The heart is the mainspring of the human machinery. If it stops, death must follow. As it is therefore the most important single organ in the body, the heart is not only well protected by Nature against injury by its position, but it is so constructed that although it never stops working whilst we are alive, yet a certain amount of rest is obtained for it between each beat. How this comes about will be explained later. The heart lies deeply in the chest and is covered on each side by parts of the lungs. It is roughly the shape of a pear turned upside down with the lowermost part called the apex, corresponding to the stalk-end, pointing downwards and to the left, whilst the thicker portion, called the base, points backwards and to the right. About two-thirds of the heart lies to the left of the middle of the breast-bone, whilst the other third lies to the right. The size of the heart in an average adult is about five inches long, three and a half inches broad and two and a half inches thick. It weighs about nine ounces. The most important part of the heart as far as its work is concerned is the muscle of which it is chiefly made. As long as the muscle is able to act properly and to pump the blood through the various parts of the heart into the blood-vessels and so into all the organs of the body, the heart will do its work well. Once the muscle is damaged the heart is no longer a hundred per cent. efficient. The walls of the heart, which are



THE HEART
A Vena cava (superior and inferior); B Aorta; C Semilunar valves of the aorta, D Pulmonary artery; E Pulmonary veins; F Left auricle (only partly visible); G Right auricle; H Left ventricle; I Right ventricle; J Muscular wall of the heart

all made of muscle, enclose four separate spaces or cavities, two auricles, the right and the left, and two ventricles, the right and the left. The right auricle and ventricle open into each other, whilst the left auricle and ventricle also open into each other; but there is no communication between the right and left auricles or the right and left ventricles. In fact, the right spaces or cavities of the heart have no communication with the left cavities. This statement is only true of fully developed hearts. Before birth, the right and left auricles open into each other through a tiny hole, about the size of a goose-quill, and sometimes, though rarely, this hole does not close at once after birth, as it should, with the result that one form of heart disease is caused by some of the blood being sent from one auricle to the other directly.

The right auricle receives its blood from all the veins of the body through two large veins, the superior and inferior vena cava (*see* Diagram). From the right auricle the blood passes into the right ventricle, whence it is pumped through a large blood-vessel, the pulmonary artery, to the lungs, In the lungs the blood takes up the oxygen which is necessary for the nourishment of the tissues of the body and is returned to the heart into the left auricle by four large veins, the pulmonary veins.

From the left auricle the blood passes into the left ventricle, and from there it is pumped into the biggest blood-vessel of all, the aorta, which distributes the blood all over the body. Both the ventricles have more work to do than the auricles, because they have to pump the blood further, but whereas the right ventricle has only to send the blood through the lungs, the left ventricle has to send it all over the body. It is not surprising, therefore, that the muscle forming the wall of the left ventricle is nearly three times as thick as the muscle forming the wall of the right ventricle, whilst the muscle of the auricles is very much thinner than that of either ventricle. Nature has very cleverly provided a method to ensure that the blood goes the right way in the heart, that is, always from auricle to ventricle and not the reverse way from ventricle to auricle. This method acts on the valve system and there are a series of valves, like doors, at the entrance to each of the cavities of the heart, which shut immediately the blood has passed through them and thus prevent any falling back into the cavity it has left. The valve between the right auricle and ventricle has three little flaps or cusps to it, so it has been named the "tricuspid" valve. That between the left auricle and ventricle has two such flaps to it, and looks rather like a bishop's mitre, so it has been called the "mitral" valve. There are also valves at the junction between the right ventricle and the blood-vessel which arises from it (the pulmonary artery), and between the left ventricle and the aorta. These valves each consist of three flaps or cups in the form of little pockets, the openings of which face away from the ventricles, so that when blood tries to pass back into the ventricle the pockets fill out and so close the opening which they guard. From their shape, which is like a half-moon, these valves are called the "semilunar" valves. (*See* Diagram.)

How the Heart works.—The action of the heart is that of regular pumping. But the whole heart does not work at the same time. First, the muscle of the two auricles contracts, forcing blood into the two ventricles, just as water would be expelled from a rubber ball containing it by squeezing the ball. Then the muscle of the two ventricles contracts, forcing blood into the pulmonary artery and into the aorta. Whilst this is happening, the muscle of the two auricles has become slack, or as the cavities are emptied, they are said to be at rest, or in "diastole."

When the cavities are contracting they are said to be in "systole." But as soon as the auricles have got rid of all their blood into the ventricle and had a short rest, blood commences to flow in to them again from the large veins and so they become filled with blood once more and by contracting and again forcing blood into the ventricles the whole of one heart-beat is completed. The ventricles get their rest after they have contracted, whilst the blood is flowing into the auricles, and the length of time they get this rest at every beat of the heart is about four-tenths of a second. When it is considered how hard the ventricles work to pump blood into the large blood-vessels which carry it all over the body, it will be realized how important it is for the ventricles to get this long rest, which takes in time,

one-half of the whole time of the heart-beat. One of the serious signs of heart disease is a shortening of the time of rest the ventricles get at each beat, because this shows that they are either not getting enough nourishment themselves, or that the muscle is getting so weak that it cannot contract well enough to force all the blood out at each beat and so must work quicker. In a healthy heart there is an excellent supply of nourishment provided for it by special blood-vessels called the coronary arteries, which arise at the beginning of the aorta, so that the heart receives the blood with the most oxygen for its own nourishment. Sometimes these arteries become hardened and their openings are so narrowed that insufficient blood is pumped through for the nourishment of the heart. Then serious symptoms of heart disease arise, because a badly nourished heart must be a badly working heart.

The rate at which the heart beats depends on several things. One is the "pace-maker" of the heart, which is a tiny particle of tissue partly made of nervous tissue and partly of a special kind of muscle, which lies in the wall of the right auricle and starts off the contraction of the auricles. When the auricles contract, a message is sent—how, we are not yet quite certain—to another piece of special tissue, from which messages are sent out, as from a central telephone exchange, to the walls of the ventricles, to cause them to contract. Normally, this sequel of events always takes place: first the auricles contract, then the ventricles, the whole cycle being a regular one. When the ventricles contract, owing to the elastic tissue in the walls of the blood-vessels, a wave of contraction is sent along them and this wave can be felt at the wrist in the radial artery, at each beat of the heart, being known as the "pulse." In certain diseases of the heart this normal sequence of events is disturbed and either the ventricles do not obey the instructions correctly to contract at every command they receive from the auricles or they may choose to contract at every second, or third or fourth command—or they may even go on strike and contract "on their own," when and how they choose.

The effects of this difference in rhythm between contraction of the auricles and that of the ventricles will be discussed when diseases of the heart are described. The rate of the heart-beat is also controlled by the nerves. Certain nerves slow the heart, others make it beat faster. If one listens over the beating heart, two sounds can be heard at each heart-beat. The first represents the contraction of the ventricles; the second, the closing of the pulmonary and aortic valves when the blood which has been forced into them during the contraction of the ventricles recoils against the closed valves. The first sound is much longer and louder than the second, which is a short, sharp sound. The two sounds together rather resemble the sound of the words "lubb-dup." On an average, the heart beats seventy-two times a minute. It beats more quickly when we are standing up than when we are sitting down, and slowest of all when we are lying in bed. Hence the importance of rest in bed in the treatment of serious heart disease.

Diseases of the Heart.—There are some diseases of the heart which may occur at any age; but, generally speaking, various types of disease attack the heart at certain ages and it is convenient to discuss disorders of the heart as they occur in childhood and adolescence, in adult life and in old age. Before these are dealt with however, it must be said that many symptoms which the average person thinks are due to heart trouble have, in fact, nothing whatever to do with the hard-worked and much abused organ. It is merely protesting as a result of some condition in another organ. For example, an over-loaded stomach will, in a person who is foolish enough to go straight to bed on top of a heavy meal, give rise to a very severe attack of palpitation and pain round the heart. Similarly, a person who is suffering from anæmia will often be short of breath and have palpitation, but these symptoms are only the expression of the poor quality of the blood which is sent to the heart; when the heart is supplied with a richer blood, or in other words, when the anæmia is cured, the symptoms of heart trouble disappear.

Fear, or a sudden fright, will also, in a nervous person, give rise to what may appear to be a quite alarming attack of palpitation of the heart, but this is a symptom only of the nervous control of the heart getting temporarily upset and is of no consequence.

The heart itself is healthy. This is the explanation of what was called "Soldiers' heart" during the war, or D.A.H. Unable to give expression to their fear in any other way, the natural fear of the soldiers at the front was translated, quite unconsciously, into a symptom of heart disease. It is possible to tell by careful examination exactly how much the heart is capable of doing, and it was found that in these "irritable hearts" the working capacity was as good as that of a normal heart.

Heart Disease in Childhood and Adolescence.—It has already been mentioned that in some children the communication between the right and left sides of the heart, which is present before birth, does not close at the proper time and so there is a mixture of venous blood (which has not been sent to the lungs to pick up oxygen) with the oxygenated blood which is sent to all the other tissues of the body, and that this causes one form of heart disease in children. Fortunately this is a rare condition, like another condition from birth in which the artery which takes blood to the lungs is narrower than normal, so that less blood than usual can be oxygenated at a time. The children who suffer from these failures in development are "blue" children, physically and mentally. They are small, dainty people, but have bluish faces and are always short of breath, getting tired easily. They need much more care and attention than normal children to rear them, as they are liable to lung troubles besides the usual childish illnesses. Special schools are indicated for them, as their shortness of breath makes general school life too difficult for them. They sometimes survive into adult life, but rarely live beyond middle age.

Although these cases are rare, it is a fact that nearly three-quarters of all cases of heart disease have their beginnings before the age of twenty-one years. It is in childhood and early adolescence that acute rheumatism—in one of its many forms—attacks, and unless the greatest precautions are taken, the heart is affected, never to be perfectly healthy again. It cannot be too strongly brought home to parents that a child who complains of pains in the joints (often called "growing pains"), or a sore throat, or who is "jumpy" with St. Vitus's Dance, is threatened with permanent heart disease if these complaints are not taken seriously and treated. The school medical services are doing much to prevent this terrible toll of heart disease in young people, but much more could be done in early cases by the parents themselves. The germ causing the "sore-throat" or other complaint settles itself in the lining of the heart, near the valves and the resulting damage to the valve or valves (sometimes more than one is attacked), produces a narrowing of the passage so that the blood has to be forced through.

In other cases, the valves are stretched so that they will not close properly, and some of the blood flows back at each heart-beat into the cavity from which it has been pumped. In order to drive the blood through the narrowed valve, or to deal with the excess of blood caused by the back-flow, the muscle wall of the cavities of the heart must thicken so as to become more powerful. When this happens, the damage is said to have been "compensated."

There comes a time, however, when the muscle can thicken no more, and it then begins to stretch and the cavities of the heart get larger; they dilate, but the muscle is less powerful and cannot contract so strongly. Then symptoms of distress appear, more blood gets dammed back in the cavities, from the left auricle blood gets dammed back into the lungs, and signs of congestion of the lung result. This pressure of blood is transmitted to the right side of the heart through the pulmonary artery and from there to the veins which bring blood from all the parts of the body. The swelling of the legs which is typical of dropsy is the result of this "back pressure." But even before dropsy occurs, the heart muscle may degenerate, giving rise to irregular and valueless contractions in the auricles which the ventricles follow quite irregularly, with the result that the beat of the pulse which reflects the beat of the ventricles is completely irregular both in force and time. These happenings are the common sequels to rheumatic heart trouble in childhood, and a consideration of the possible damage to the heart by tonsillitis or "growing pains" should be carefully weighed by every parent.

Heart Disease in Adult Life.—Apart from the sequels to rheumatic infection in childhood and the same infection in early adult life, the most crippling cause of heart trouble

in early middle life is syphilis. This disorder especially attacks the great blood-vessel, the aorta, which supplies the smaller arteries, and which arises from the left ventricle. The valve guarding the opening of the ventricle into the aorta is also commonly attacked and, as a result, it fails to close properly at each heart-beat, allowing some of the blood to flow back into the ventricle. The muscle of this ventricle is able to thicken to an enormous size, till the heart becomes as big as that of an ox; but finally, it can thicken no longer and then degenerates and signs of heart failure appear. It is in connection with disease of the aorta that attacks of pain occur. These may be so severe as to give the impression to the patient that death will soon follow; typical attacks of angina pectoris, or there may be other milder attacks of pain over the front of the chest with a feeling of suffocation, the pain sometimes being felt, as in true angina, down the left arm.

In early middle life also, the conducting apparatus of the heart may become diseased, in some cases the cause being unknown, in others being due to the results of syphilis. Whatever the cause, the result is the same: the ventricles no longer respond to every contraction of the auricles, since the conducting apparatus either conducts only every second, third, or fourth beat, or it fails to conduct at all, and the ventricles contract at their own rate, which is about 40 beats per minute, instead of the normal 72. This very slow beating of the ventricles sometimes produces attacks of unconsciousness with convulsions. These attacks are of serious import as they signify that insufficient blood is being supplied to the brain.

Heart Disease in Old Age.—Heart disease in old age is either the result of arterio-sclerosis, or of degeneration of the muscle of the heart. Sometimes there is a combination of these two conditions, as the arteries which supply the heart itself, the coronary arteries, become narrowed through arterio-sclerosis and the heart-muscle degenerates because the blood supply is not sufficient for its needs. The pumping action of the heart is thus affected and gradually it fails to be able to maintain the circulation. Occasionally, a large part of the heart-muscle is suddenly deprived of its blood supply by a coronary artery getting blocked up; it becomes so narrowed that only a small quantity of blood can pass, and then one day it gets blocked altogether. If a main coronary artery is affected in this way, death is almost sure to follow immediately.

In simple degeneration of the heart-muscle, gradually, failure of the power to do much without getting short of breath and over-tired is the usual complaint. Pain round the heart is not common. This condition may continue for years with but few symptoms and signs, provided that reasonable care is taken of the limited capacity of the heart for work.

The Treatment of Heart Disease.—In any form of heart disease the essential treatment is to limit the patient's output of energy to that which the heart is capable of sustaining without further damage. Every case of heart trouble must be under the care of a doctor. All that can be said here is to indicate a few simple rules which will serve merely to emphasize the general line of treatment in heart disease. Rest for the heart is, above all, the most important measure. When rest in bed is decreed by the doctor for a patient with heart trouble, rest it must be, and the patient must on no account get up out of bed to wash or to go to the lavatory.

This is especially important in the case of children with rheumatic heart disease, as a lengthy period spent in bed when the heart is first attacked may save it from serious damage. Formerly, an attack of acute rheumatism in children meant six months in bed if permanent heart trouble was to be avoided. Now, thanks to modern methods of treatment by salicylates and certain forms of hot baths, this period has been cut down to about six weeks. It is advisable for anyone with a damaged heart to rest in bed at least one day a week if this is at all possible, and over-exertion must at all costs be avoided. Occupations should be chosen in which manual labour is reduced to a minimum. On the other hand, a certain amount of exercise should, unless ordered to the contrary, be taken. Easy walking, or games which do not involve a deal of exertion, such as bowls, for example, should be enjoyed; but any noticeable shortness of breath after exertion is a warning to "go slow." Personal hygiene is very important; the mouth should be kept scupulously clean and the teeth must be kept free from sepsis as septic teeth

harbour germs which will attack a heart already damaged and give rise to a very serious and often rapidly fatal disease of the lining membrane of the heart. The use of alcohol and tobacco must be regulated by the patient's medical attendant, as each individual case has to be considered separately; but generally speaking, it is possible to allow a patient who has been a heavy smoker and drinker a small amount of liquor or tobacco, though any increase in his symptoms or signs may necessitate their withdrawal.

Treatment of heart disease has been almost revolutionized since the introduction of certain drugs. The salicylates have already been mentioned in connection with rheumatic heart disease. The use of digitalis in a stronger form and in large doses has saved many a person's life which would have been thrown away twenty years ago, whilst the onset of dropsy, formerly a dreaded sign, can now be combated with success by new mercury preparations. Another drug, quinidine, has been very successful in expert hands in restoring the normal rhythm of the heart where this has been upset. But the treatment of heart disease really lies in prevention and if the rheumatic cases can be taken in time to stop the damage at the outset; if the syphilitic cases are treated for their syphilis before the germ has time to reach the heart; and if those with a family history of high blood-pressure will, in their early years, live so that arterio-sclerosis does not develop, then heart disease will cease to be the commonest cause of death, as it is to-day, but will become one of the rarest. (*See also* ANEURYSM; ANGINA PECTORIS; ARTERIOSCLEROSIS; ENDOCARDITIS; MYOCARDITIS; PERICARDITIS, etc.)

HEARTBURN.—This is the name given to a burning feeling extending up from the stomach through the chest to the mouth. It is due to the flowing back of acid fluid from the stomach—it sometimes happens that a quantity of this fluid may actually reach the mouth—accompanied by a gush of saliva. It is due to indigestion, and it is also one of the symptoms of various disorders of the stomach. During pregnancy heartburn may frequently occur and cause considerable discomfort.

Treatment.—To remedy the condition the diet must be regulated and all rich foods should be avoided. The safest things to take are milk, cream, butter, eggs, fish, chicken and all foods which are easily digested. Alcohol and all spices and such-like things should be absolutely avoided. As soon as an attack occurs the most effective way of gaining relief is to take half a teaspoonful of bicarbonate of soda in a little water. The same quantity of sal volatile will do just as well. (*See also* DIGESTION; INDIGESTION; PREGNANCY.)

HEAT.—Heat applied either to the body as a whole or to a particular part of it is one of the most useful treatments we have for certain conditions. This usefulness of heat is well shown by the way we rush to the hot-water bottle in all sorts of emergencies. Placing a hot-water bottle on a particular spot, such as an earache or a pain in the stomach, is a local application of heat, and the pain is relieved by the action of the heat which calls a larger supply of blood and the fluid called lymph to the spot. By this means more of the antidotes to disease which the blood and lymph contain are brought to the spot where they are needed, and the heat also eases pain by causing relaxation in muscles and nerves of the affected part.

Heat applied to the body as a whole in the form of baths increases the activity of the skin, and thus rids the body of the poisons which cause such diseases as rheumatism. The whole subject of treatment by heat by means of baths and electricity will be found discussed in the articles under those headings.

HEAT-STROKE.—An illness resulting from exposure to the sun. (*See* SUNSTROKE.)

HECTIC FEVER.—A type of fever which occurs in advanced stages of tuberculosis in which the temperature swings backwards and forwards, sometimes as high as 105° F. in the morning and very often below normal in the evening, is known as hectic fever. The patient is usually in a very wasted condition and night sweats are frequent. (*See also* TUBERCULOSIS.)

HEEL.—The heel is the hinder part of the foot and it is formed by a bone called the os calcis or calcaneum. This bone bears most of our weight when we are standing, but the heel is raised with every step we take by the muscles of the calf, which are attached to the bone by the tendon of Achilles.

Apart from the usual diseases which may attack bones, the heel is not subject to

disease. The skin may become hard or tender from rubbing against the shoe, and corns occasionally form on the heel. Severe pain may be a symptom of rheumatism. (*See also* ACHILLES TENDON.)

HEIGHT.—The height of a person is to a great extent determined in advance by his parentage, though it is not an invariable rule that short people will have short children or that the offspring of tall parents will be tall. The length of a baby at birth is from sixteen to eighteen inches and in the first year growth is rapid. After that it is fairly uniform, being from two to four inches in a year until the age of puberty. A girl usually reaches to within two or three inches of her full height between the ages of twelve and fourteen, then grows slowly until about her twentieth year. A boy, on the other hand, continues his rapid growing rate until about the ages of sixteen to eighteen and will then put on another couple of inches between then and his early twenties.

Growth depends greatly upon proper feeding and proper working of certain glands, notably the pituitary gland near the brain. If this gland is not working properly the child may become either a giant or a dwarf. It has now been discovered what to do for these unfortunate children and it is becoming possible to enable them to grow up more normally than was formerly possible. Apart from defects of the pituitary gland the most important factor in promoting proper growth is a well-balanced diet with sufficient vitamins. The undersized, bent, rickety children that used to be so common are now becoming a rarity.

When too rapid growth is taking place at the growing age of a child it is as well to make him take life as easily as possible and rest as much as possible, to prevent bending of bones, spinal curvatures, etc. (*See also* BRAIN; DUCTLESS GLANDS; DWARFS; GIGANTISM; GROWTH.)

HELIOTHERAPY.—Derived from two Greek words which mean sun-cure, heliotherapy is the term given to the treatment of disease by exposure to the rays of the sun. (*See also* SUNLIGHT.)

HEMIANOPIA.—Blindness of half of the field of vision in each eye is known as hemianopia. In this condition, a person may be able to see everything in front of him and on one side, but not the other; or he may be able to see objects on either side but not in front. Either the left or the right side may be affected. This is due to an interference with the nerves leading to the brain, generally the result of a wound in the head, or a tumour in the brain.

HEMICRANIA.—A complaint in which headache occurs on one side of the head. (*See also* HEADACHE.)

HEMIPLEGIA.—Paralysis of one half of the body is known as hemiplegia. It is caused by diseases affecting the central part of the brain. (*See also* BRAIN; PARALYSIS.)

HEMLOCK.—Preparations of a drug known as conium are obtained from the leaves and young branches of the hemlock plant. At one time, preparations of this drug were very popular in the treatment of various diseases, but it has fallen into disuse of recent years because of the uncertainty of the strength of these preparations. Various preparations are used, however, in the treatment of whooping-cough, asthma and epilepsy, and as an ointment it has been applied to give relief in piles and painful cracks around the anus. In large doses it causes dimness of vision and paralysis, and death may take place from asphyxiation. This is the poison by which Socrates was put to death.

Treatment.—In cases of poisoning give an emetic. The stomach should be washed out and tannic acid given. The patient must be kept warm and artificial respiration carried out.

HEMP.—Extracts of Indian hemp produce a powerful drug known as cannabis indica, hashish, or bhang. (*See also* CANNABIS INDICA.)

HENBANE.—The henbane plant gives us a drug known as hyoscyamine as well as other preparations, especially the alkaloid hyoscine. The majority of our henbane comes from Egypt where it grows in large quantities. (*See also* ATROPINE; HYOSCINE.)

HENNA.—The hair dye known as henna is obtained from the powdered leaves of an Eastern plant, the lawsonian inermis. Henna has been used as a hair dye for centuries past and, as it dyes the skin as well, the women of the East make use of it to redden their finger-nails, the soles of their feet, and the palms of their hands. Even the men in Mahomedan countries use it to dye their beards. Henna mixed with indigo gives

varying shades of brown; the longer the dye is left on, the darker the hair will become. About one hour will give a light brown shade, but experiments should be carried out before actually trying it on the hair.

HEPATIC. — Hepatic means anything associated with the liver. A *hepatic abscess* is an abscess of the liver. The *hepatic artery* is the artery which supplies the liver with blood, and the *hepatic ducts* are the passages by which the bile flows away from the liver. The hepatic ducts join with the cystic duct leading from the gall-bladder to form the common bile duct which leads into the duodenum.

HEPATITIS.—Hepatitis means inflammation of the liver. (*See also* LIVER.)

HERBALIST.—A person who deals in medicinal herbs is known as a herbalist. As a rule these people are not qualified druggists or chemists, but an Act passed during the reign of Henry VIII enables them to carry on their business of selling remedies. They are, however, unable to deal in drugs included in the Poisons' Schedule of the Poisons and Pharmacy Act, 1908.

HERBS.—In the walled garden of a public park in London, there used to be a bed planted with "all the herbs that Shakespeare knew." It is a pity they are no longer to be seen, for herbs are among our most interesting English possessions.

As medicines, various herbs have been used for centuries, and many people to-day use them for simple ailments, as their parents and grandparents did for generations back. Dandelion and nettle concoctions are well known, and not many years ago men went through the streets of northern towns in springtime, crying their wares—"Nettles! Nettles! Purify the blood!"

Among books on herbs, Gerard's "Herball" is perhaps the best known, though he was by no means the first to write about herbs; herbals known to scholars date back some nine hundred years in this country alone. Gerard, who lived in Holborn and had his garden in Fetter Lane, was a neighbour of Shakespeare, and it is pleasant to think that the great dramatist may have visited the great gardener, and that possibly some of the references to herbs in the plays resulted from visits to Gerard's garden.

Among a number of herbs mentioned by Gerard are some that grew wild in Gray's Inn Lane and the meadows near that now busy thoroughfare.

Here are some of his herbs, with their uses:

Basil.—The smell, he says, "is good for the heart. It taketh away sorrowfulness, which cometh of melancholy and maketh a man merry and glad."

Bawme (balm?).—"Comforts the heart and driveth away all melancholy and sadnesse; it makes the heart merry and joyfull and strengtheneth the vitall spirits."

Borage.—Gerard quotes an old rhyme:

"I, Borage,
Bring alwaies Courage."

Borage too is recommended for driving away sorrow and "encreasing the joy of the minde. The leaves and floures put into wine make men and women glad and merry and drive away all sadnesses, dulnesses and melancholy."

Bugloss.—"The physitions use the leaves, floures and rootes and put them into all kindes of medecines indifferently, which are of force and vertue to drive away sorrow and pensiveness of the minde, and to comfort and strengthen the heart."

Chervil.—The root, boiled and "dressed as the cunning Cook knoweth how better than myself is very good for old people that are dull and without courage."

Cow Parsnip.—"If a phrenticke or melancholicke man's head bee anointed with oile wherein the leaves and roots have been sodden, it helpeth him very much, and such as bee troubled with the sickness called the forgetfull evill."

Dead Nettle.—"The flowers baked with sugar, as roses are, maketh the vitall spirits more fresh and lively."

The "physitions," it would seem, relied much on raising the spirits of their patients by herbs; but here is a cure for nightmare; the peony being reckoned as a herb.

"The black graines (of the peony) to the number of fifteene taken in wine or mead is a speciall remedie for those that are troubled in the night with the disease called the Night Mare, which is as though a heavy burthen were laid upon them and they oppressed therewith, as if they were overcome with their enemies, or overprest with some great weight or burthen, and they are also good against melancholic dreames."

Pennyroyal, worn as a garland about the head "is of great force against the swimming in the head, the paines and giddiness thereof."

Rosemary is another herb to be worn as a garland: "It comforteth the brain, the memorie, the inward senses and comforteth the heart and maketh it merry."

Sweet Marjoram is good for "those who are given to over-much sighing."

Trefoil (shrubby).—"If a man hold it in his hand he cannot be hurt with the biting of any venemous beast."

The tactfulness of the remarks under Solomon's Seal is striking:

"The root stamped while it is fresh and greene and applied taketh away in one night or two at the most any bruise, black or blew spots, gotten by falls or women's wilfulnesse in stumbling upon their hasty husbands' fists or such like." (*See also* TISANES.)

HEREDITY is that which determines the bodily and mental characters we get from our ancestors. The study of heredity is of the utmost importance, not only in medicine, but in all scientific work which deals with living things. The relation of parents to offspring has a real practical value in farming and agriculture, where the best types are naturally chosen for reproduction. But here we are more concerned with the medical aspect of heredity. It is a very old saying that "like tends to beget like," but why is this so? In the higher animals, reproduction takes place by the union of the male and female germ-cells, the sperms with the ova, or egg-cells, and after this union, or fertilization as it is called, the new individual develops from the egg-cell, the whole complicated structure of the offspring being formed from these two germ-cells.

The theory of heredity depends on the supposed fact that there is, in each of these parent germ-cells, some substance which is not used up in the construction of the body of the offspring, but is reserved unchanged for the formation of the germ-cells of the next generation. The germ-cells give rise to all the body-cells of the offspring, and therefore characters borne in the germ-cell of the parent appear in the offspring and are also stored up in the germ-cells of that offspring so that they may be passed on to the next generation. From this explanation it will be seen that it is very unlikely that characters in the parent which are the result of external influences or surroundings will have any effect on the offspring.

This fact disposes once and for all of the belief which has frightened so many mothers-to-be, that if a woman suffers an injury, or is frightened by some horrible sight whilst pregnant, her offspring will be deformed or bear some mark caused by the effect of the injury or impression on the mind of the mother.

The influence of inherited character as opposed to that induced by surroundings was tested a few years ago in Scotland. A number of young children from the slums of one of the biggest cities, whose parents all had bad criminal records, were transported to a peaceful fishing village on the coast where nothing was known of their history, and they were put in charge of kindly fisher-folk. But when those children grew older the influence of their criminal heredity was seen; the peaceful fishing village was peaceful no longer and the village inn resembled a thieves' kitchen. The experiment was a failure, as anyone who had studied heredity could have predicted. But it is important to note that *all* the parents had bad records, that is to say, the unfortunate children inherited badness from both sides. There is a very definite law governing the inheritance of certain bodily qualities, and there is every reason to suppose that a natural law also governs the inheritance of mental qualities.

The law which governs the inheritance of bodily characters is Mendel's law. This was based on plant experiments, but the principles apply to the whole of the animal kingdom. Briefly, if a tall plant is "crossed" with a short one of the same species, the resulting plant will be a hybrid, neither tall nor short. If this hybrid be now "crossed" with a similar hybrid, given an "even chance" union of the pollen grains with the egg-cells, the resulting generation will be a quarter tall plants, a quarter short plants, and half hybrids like their parents. This law of inheritance has been shown to operate in certain well-defined characters in the animal kingdom. To name but a few: the size of the comb in fowls, horned or hornless condition in cattle, the presence or absence of brown pigment in the iris of the eye in man. The new science of eugenics, which suggests selective mating for human beings so that

the best characters of the race should be preserved, is only an attempt to apply the laws of heredity. Whether such a step will ever be taken cannot here be discussed. The important thing is to secure that those who suffer from known diseases which they can pass on to their offspring should be warned against, and if necessary, debarred from, marriage.

There are many disorders which are passed from one generation to the next and families are known in which such disorders can be traced back for several generations. The one most commonly heard of, is hæmophilia, which is an inherited tendency in boys to bleed from the merest scratch. Unless very special measures are taken to stop the bleeding, such unfortunates bleed to death from very slight wounds; their blood has no power of clotting. This inheritance is always passed through the mother, but girls never show it. Another less common, but none the less terrible, disease is a certain nervous trouble which afflicts children in affected families. These children —and if the family is large, several in the same generation will suffer—are born normal, and are apparently healthy up to the age of a year or so, when they "go backwards," cease to crawl or to sit up and become blind. They usually die within a few months after this has happened. This condition is especially associated with the Jewish race, though families not of that race have been known to be so afflicted.

Various other nervous diseases are inherited, that is, passed from one generation to the next. It is not really surprising that the nervous system should suffer thus when we consider that it is by virtue of our highly developed nervous system that we differ from the highest members of the animal kingdom, and so the "last to develop is the first to go." The question of inheritance of disorders of the mind, especially the more obvious forms of insanity, is a debated point. There can be no doubt that when there is actual insanity or definite mental weakness on both sides, the offspring will certainly be at least feeble-minded. In America, the descendants of two insane persons were traced through several generations and the proportion of idiots, feeble-minded, and criminals, was found to be exceedingly high. But where one partner is mentally weak or suffers from some periodic form of insanity, there is some evidence to show that the healthy partner can more than counter-balance the mental weakness of the other, and the offspring have a good chance, provided they are not exposed to conditions which will favour the development of mental stress, of escaping their parent's fate. Epilepsy is one of the conditions which we know may be handed down from generation to generation; it appears to be one of those characters which are "dominant," that is, it tends to assert itself more often in the offspring than would be expected from an even chance of the mating of two individuals. The question of the inheritance of syphilis is not only a medical one, but is of legal and social importance. It used to be taught that this disease was passed "to the third and the fourth generation." This has been found to be untrue in the light of modern methods of research. Syphilis can be passed from an infected mother to her child whilst she is carrying it, but if that child survives into adult life, which is unlikely if the infection is at all severe, and marries, his or her children will not be infected.

But it is not only diseases themselves that form part of our possible heredity; various tendencies to disease may be passed from one generation to the other. Certain forms of heart trouble are a case in point. High blood-pressure "runs in families." One family may have a tendency to tuberculosis and if the necessary precautions are not taken, although the disease itself is not inherited, yet members of one generation after another in that particular family succumb to that disease. Some such tendencies show a racial peculiarity. Jews are especially liable to diabetes; the Irish to tuberculosis. Certain infirmities depend on heredity: deaf-mutism is one of the commonest, but another form of deafness may be inherited, nearly always through the female side. Such minor deformities as six toes or one short finger are examples of not infrequent inherited characters. The colour of the hair and of the pigment of the eyes is dependent on heredity. Two blue-eyed, fair-haired parents will have blue-eyed, fair-haired children. Red hair tends to be a "dominant" character; it appears in more than half of the offspring if only one parent is red-haired. Much is being done by state medicine and

education to ensure that the present generation secures and retains good health. The results of this progress in guarding the health of the population should be seen in generations to come, when in accordance with the laws of heredity, we should find a race of Englishmen with an A1 physique and brain power.

HERNIA.—The popular name for hernia is "rupture" and it is a common condition amongst men and boys and not so common amongst women. By hernia is meant the protruding through its covering of any organ of the body. The way hernia arises is well seen in the abdomen, where all the organs are contained in a covering called the abdominal wall. For one reason or another there may be a weak spot in this abdominal wall through which a piece of bowel or any of the organs contained in the abdomen may protrude. This protrusion will be seen as a lump under the skin which covers the abdomen. Similarly a coil of brain may be pushed through the covering of the brain, which is also called a hernia.

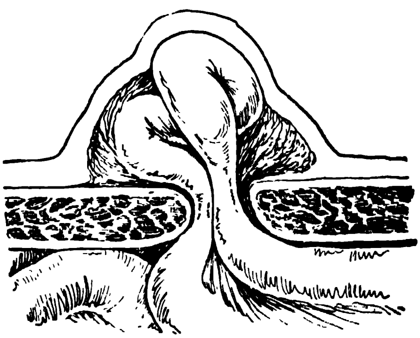
Inguinal Hernia.—The most common hernia is that called inguinal hernia. It occurs in both men and women. The wall of the abdomen is composed of a sheath of muscles in which there is an opening to permit of the passage of a cord. In men it is the cord that suspends the testicle, and in women there is a cord passing from the womb to the tissues in the groin. The opening for the passage of these cords forms a weak spot in the abdominal wall and a loop of intestine can readily protrude through it, forming an inguinal hernia.

Femoral Hernia.—Another common hernia is the *femoral hernia,* which occurs at the weak spot where the great blood-vessels of the abdomen pass into the thigh. The lump in this case is felt in the groin, at a spot lower down than the lump formed by the inguinal hernia.

Umbilical Hernia.—Hernias are also apt to occur at the umbilicus or navel. This hernia may occur at any age, but is most often found in small babies. It is also found in middle-aged women who have had several children and have grown stout.

Ventral Hernia.—A ventral hernia is a hernia that occurs at the site of a former operation. The abdominal wall is often left in a weak state after an operation, especially one in which there has been a tube for drainage purposes, and a hernia may occur here.

Treatment.—Often a hernia does not cause very much inconvenience and it is sufficient to wear a properly fitting support, called a *truss*, after the hernia has been replaced in position, or reduced as it is called; but at any moment there may be further trouble especially if heavy weights have to be lifted or there is any condition which causes straining. It is preferable therefore to have an operation, which will give a better chance of cure. The great danger of hernias in the abdomen is always that the loop of intestine which has pushed into the hernia will become *strangulated*, that is, so compressed



Hernia (Umbilical)

that its blood-supply is cut off and it dies. A strangulated hernia is a very serious matter, calling for immediate operation in order to save the patient's life. The hernias of babies and young children can nearly always be cured by wearing a small pad over the navel held on by a bandage.

HEROIN.—Heroin is a drug obtained from morphine, which it resembles very much in its general action on the body. Heroin, however, acts more strongly on the part of the nervous system connected with breathing, and because of this it is used a great deal to give relief in cases of troublesome and incessant cough. Unfortunately, as with morphine, there is a great liability to develop the drug habit, which when once formed is quite as difficult to break as the morphine habit. (*See also* DRUG HABIT; OPIUM.)

HERPES.—Herpes of the face occurs commonly on or near the lips. The symptoms are itching and "tightness" of the skin, followed by swollen reddish patches, which

in a few hours are covered with little blisters. If uninfected, they dry up in about 7–10 days. In those subject to herpes, any little "upset" to the health may bring on an attack. If cases occur persistently on the same area, infection from the teeth, nose, etc., should be suspected.

Treatment.—Those who recognize the early signs may limit an attack considerably by bathing the part with very hot water, or by applying collodion. Four per cent. silver nitrate in spirit of nitrous ether is also recommended. The blisters should be protected by a mild antiseptic powder.

Herpes Genitalis, which attacks the skin of the penis, resembles herpes facialis, but very readily ulcerates. It is *in itself* of small importance, but must be distinguished from certain venereal diseases. In some cases, also, herpes appears first, followed by a soft or hard chancre.

Treatment.—In an uncomplicated case the only treatment required is an antiseptic dusting powder, such as 1 or 2 per cent. salicylic acid in boric acid. All local disturbance must be avoided for at least six weeks.

Herpes Zoster, which is a ring of herpes encircling the body, is more usually called Shingles, and is described under that title.

HEXAMINE.—Hexamine, a drug which was formerly known as urotropine, is manufactured from formalin and ammonia. It is given as an antiseptic in the treatment of infections of the bladder, and as it is much more effective in the presence of acid than alkaline, the urine should be made acid. Sodium acid phosphate should, therefore, be given an hour or two before the administration of the hexamine.

Common colds can be treated with hexamine, as the drug is stated to have some effect on the bronchial tubes. Fifteen grains should be taken four times during the day as soon as the head begins to feel stuffy. Plenty of water should be taken in order to avoid any bladder irritation. Hexamine is also given for infantile paralysis, epilepsy, rheumatoid arthritis and many other complaints.

HICCOUGH.—Hiccough, or hiccup, is caused by a sudden contraction of the diaphragm due to some irritation of the nerves. The breath which is drawn in suddenly is checked midway, as it were, by the closure of the vocal cords. It often occurs after taking too much pepper or too hot food, and it is popularly believed that the taking of too much alcohol is responsible for an attack of hiccoughs.

Hiccough may occur as a symptom of a more serious condition than a slight attack of indigestion. In nervous disorders it may be one of the symptoms of epilepsy, encephalitis lethargica or hysteria. It often occurs in nephritis or uræmia, or it may be due to tetanus, hydrophobia or strychnine poisoning. If hiccough continues for any length of time, it is important that steps should be taken to stop it, as it may reduce the patient to a very nervous and weakened state.

Treatment.—If the hiccoughing is due to indigestion, it is often relieved by drinking a glassful of water with a little bicarbonate of soda or bismuth carbonate. Holding the breath for as long as possible is an old remedy; also stooping forward and drinking out of the far side of a glass. When the hiccoughing is due to some complicating condition it may be necessary to give soothing drugs such as chloretone or luminal.

HIGH FREQUENCY.—The high-frequency electric current is a popular way of using electricity for treatment, and is described under the heading of ELECTRICITY, MEDICAL.

HIP.—By the hip we mean the whole region of the hip-joint where the lower limb joins on to the main trunk of the body. As human beings are dependent on the hip-joint for their means of moving themselves from place to place and for the support of the body in the upright position, it is, as might be expected, the largest and strongest joint in the body. The hip-joint is embedded in strong muscular and fatty tissues forming the buttock, the thigh and the groin in front. All this region is commonly called the hip, but for medical purposes the word hip usually is taken to mean the hip-joint only.

Bones of the Hip-joint.—The hip-joint is a ball and socket joint, the ball being the well-rounded head of the femur (thigh-bone), while the socket is a cup-shaped hollow in the haunch-bone (pelvis), called the *acetabulum.* Like other bone surfaces which are exposed to rubbing, the surface of the head of the thigh-bone is covered with cartilage, and the interior of the acetabulum is lined

with cartilage which, however, does not quite reach to the outside rim of the cup, so that it exerts a sucking action as well as preventing the rubbing away of the bone by friction. This sucking action is very useful in keeping the two bones attached while allowing free movement in a circular direction. The hip has an almost complete range of movement in young and supple people. It can move round from side to side, bend up and down, and swing backwards and forwards. In young infants the hip-bone consists of three distinct parts, the ilium, the ischium, and the os pubis; but in adults these three parts are united to form the acetabulum, and complete union usually takes place about the age of puberty.

Hip Disease.—This is usually a tubercular condition which is more popularly known as "hip-joint disease" and it is almost confined to delicate children. The symptoms start quite early in life and become more noticeable as time goes on.

Symptoms.—The child generally complains of tiredness, and is noticed to walk with a slight limp. He may complain of pain in the leg or the knee, and movement of the limb is usually limited in all directions. When standing or walking, the patient will make every effort to save putting weight on the affected side, and as the condition advances this limp will become more pronounced. Gradually the muscles begin to waste about the hip and the limb alters in appearance. The thigh is bent upwards, while the foot is bent outwards, and there is usually a great deal of pain and some swelling.

Treatment.—The general treatment of hip-joint disease is the same as for other tuberculous conditions. The child should be kept in bed and some form of splint should be used to keep the limb in a normal position. He should also live in the open air as much as possible and once the limb is straightened he may go about, preferably in the country. The diet must include much nourishing food, especially fresh cream and milk. In cases that have gone too far for this treatment, an operation on the hip may be necessary. (*See also* TUBERCULOSIS.)

Hip, Dislocation of.—Dislocation of the hip at birth is by no means rare, and it is due to the imperfect formation of the acetabulum, the cup-shaped hollow in the haunch-bone into which the head of the thigh-bone fits. It is not usually noticed until the child begins to walk, and then it will be seen that the child walks in a curious waddling sort of way. In all cases it is desirable that an X-ray photograph should be taken to find out the exact type of the dislocation.

Treatment.—The treatment of this condition is purely surgical and convalescence may be quite a lengthy matter. When dislocation happens as the result of an accident the patient should never be moved until the arrival of a medical man. (*See also* DISLOCATION.)

HIRSUTIES.—This is the medical name for the condition commonly known as superfluous hair. It is described under the heading HAIR, SUPERFLUOUS, and *also* in the SPECIAL SUPPLEMENT ON BEAUTY CULTURE.

HIVES.—This is a name which is applied to many eruptions of the skin especially urticarial rashes. (*See also* URTICARIA.)

HOARSENESS.—Hoarseness or huskiness of the voice is generally the result of catarrh or inflammation of the vocal cords, but it may also result from pressure on the nerves that control the movements of the cords. Disease in the region of the glottis will affect the voice, or sore throat may arise from over-use of the voice and cause a certain amount of hoarseness. Diseases which affect the vocal cords are tuberculosis, cancer and syphilis. No person should have chronic hoarseness for a month without having the larynx examined by a specialist in case any serious disease may be beginning.

HOBNAIL LIVER.—This is a popular term for cirrhosis of the liver due to taking too much alcohol. The term "gin drinker's liver" is also used. The term hobnail is given because the surface of the liver is studded with hard projections which suggest the appearance of hobnails. (*See also* CIRRHOSIS.)

HODGKIN'S DISEASE.—Hodgkin's disease, otherwise known as lymphadenoma or lymphogranuloma, is a disease in which the lymph-glands and the spleen become enlarged. The condition is named after Thomas Hodgkin (1798–1866), an English physician who was the first to make records of several cases of this disease.

Symptoms.—The disease usually comes on very gradually and men are more often affected than women. The first symptom is

enlargement of the glands of the neck and there may be a great feeling of weakness accompanied by breathlessness. The glands in the groin and under the armpits may swell up, and the glands in the chest and abdomen may also become affected. These enlarged glands may cause pressure on the nerves of the various parts affected and much pain may result. Pressure on the spinal cord may cause paralysis to take place. In about 75 per cent. of cases the spleen is enlarged, but it is unusual for enlargement of the liver to occur. A slight degree of fever is generally present and it is not unusual for the skin to turn a bronzed colour. At this stage there may be definite symptoms of anæmia and the patient usually complains of weakness and loss of weight. The cause of the complaint is thought to be tuberculosis, but although there are several theories as to the actual cause, nothing, as yet, has been definitely proved.

Treatment.—There is no known cure for Hodgkin's disease, but treatment with arsenic usually causes a temporary improvement. Plenty of rest, fresh air and nourishing food should be given. X-ray treatment has also been known to cause a temporary improvement. (*See also* LYMPHATICS.)

HOMICIDAL MANIA.—Homicidal mania is the state of insanity in which there is the unrestrained impulse to kill human beings. Various states of insanity may give rise to the homicidal impulse. These are described under the headings INSANITY; MANIA; MELANCHOLIA.

HOMICIDE.—By homicide we mean killing a man, the word man of course including women and children. If the killing is accidental the homicide is not called murder or manslaughter as it is if there has been the intention to kill.

HOMŒOPATHY.—A system of treatment of disease by drugs which, if given during health, would produce the same symptoms as the disease. These doses are given over a long period in very small doses.

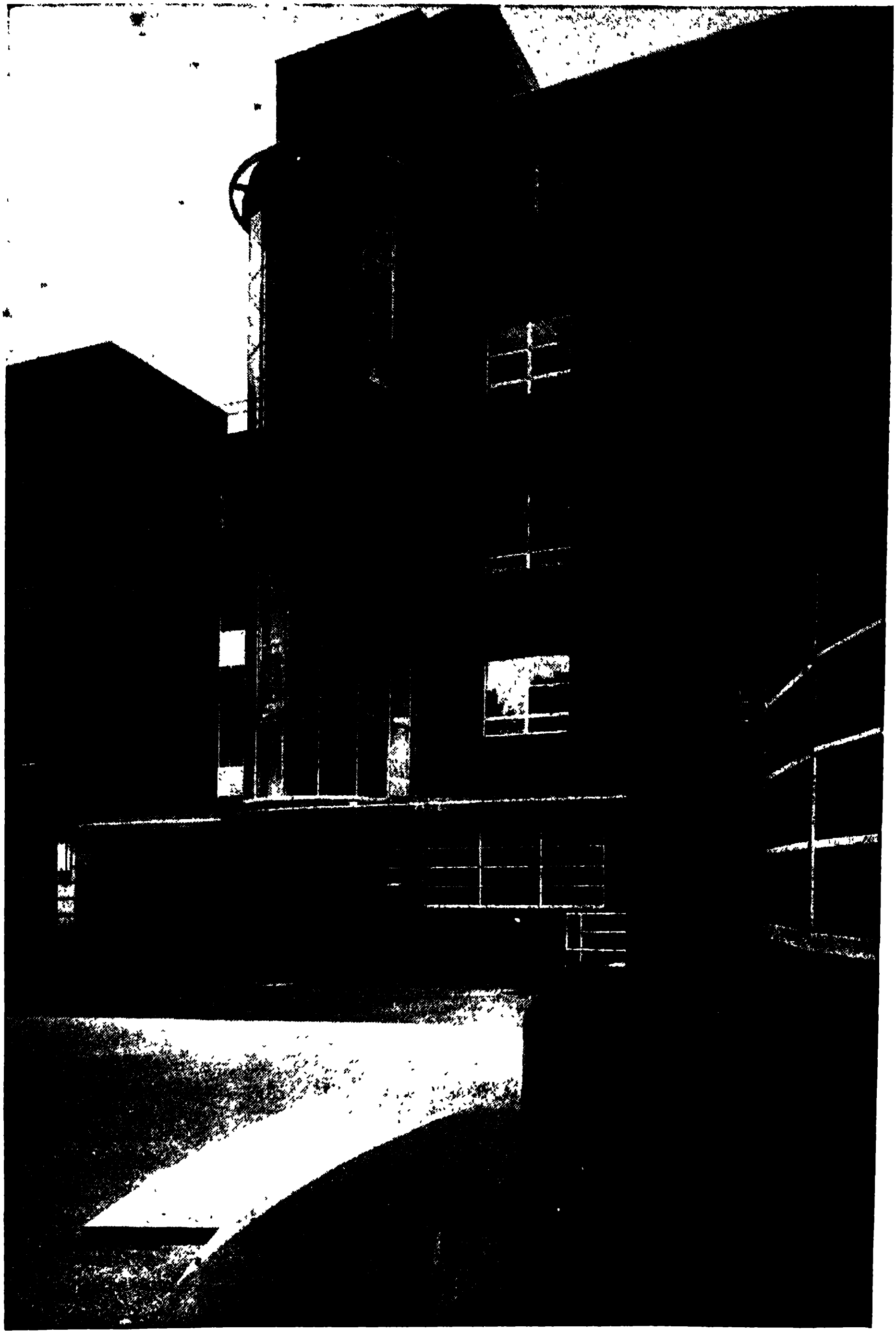
HOOKWORM DISEASE.—Hookworm disease, or ankylostomiasis as it is medically termed, is produced by the presence in the human body of a worm known as the hookworm. Another name for this condition is "miner's anæmia." The worms produce thousands of eggs which are discharged from the intestine of the infected person. When these come in contact with damp soil or water, they hatch out into embryos which enter the skin of someone else and then pass by means of blood to the heart and lungs, and finally into the intestine. They usually enter the human body through the soles of the feet, producing what is known as "ground itch." The disease is to be found particularly in warm climates such as Egypt, India, China, Ceylon and the Southern States of North America.

Symptoms.—Small sores and swellings may occur in the feet, but these usually heal up within a week or so. Several months may pass before the patient becomes aware of any other symptoms. Later on he may complain of shortness of breath, palpitations, and general weakness. There may also be flatulence and constipation, or diarrhœa. The appetite is usually good, but pica (dirt eating) is a characteristic of the disease. The complexion may appear pale and sallow, and the temperature may be slightly raised. The stools usually are stained with blood. The disease may go on for many months if untreated, but under treatment the chance of recovery is usually good.

Treatment.—In the treatment of this disease various anthelmintic drugs are used (anthelmintic is the name given to any drug which is used in the treatment of worms). Oil of chenopodium and carbon tetrachloride are very largely used, but they should not be taken unless under medical attention. Prevention of the disease consists in giving careful attention to the disposal of fæces or excreted matter; the water supply must be pure, and shoes and stockings should be worn, especially by children.

HORDEOLUM.—Hordeolums are better known to everyone as styes on the eyelids, and are described under the name STYE.

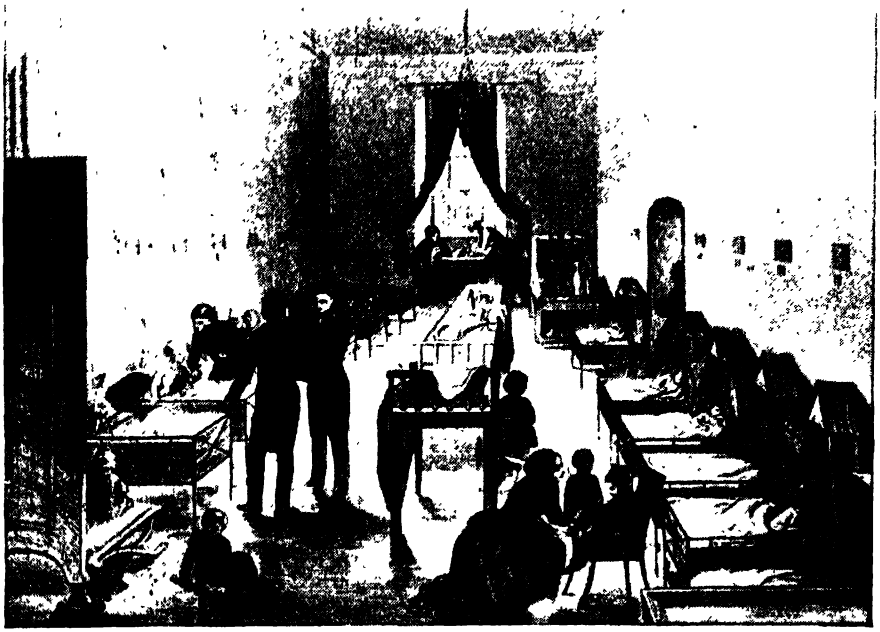
HORMONES.—By hormones we mean substances which are produced by various glands of the body and poured by them directly into the blood-stream of the body. In other words they are the *secretions* of the *ductless glands*. The study of the ductless glands and their secretions which include substances like adrenalin, pituitrin and insulin, is a branch of medical science in which great advances are being made, and an account of this new knowledge will be found in the article called DUCTLESS GLANDS.



MODERN HOSPITAL ARCHITECTURE

The Freemasons' Hospital, London

HOSPITAL.—A hospital is a building for the treatment of sick or injured persons, and in this country may be either a *voluntary hospital*, a *muncipal hospital*, a *state hospital*, or a *private hospital* or nursing home; a voluntary hospital with less than 50 beds is in the country and small towns termed a *cottage hospital*. The oldest of the voluntary hospitals is St. Bartholomew's, founded in London in the twelfth century, and the largest is Edinburgh Royal Infimary, which has over a thousand beds and will have several hundreds more when its extensions are completed. The most important of the voluntary hospitals are *teaching hospitals*, which have medical schools attached to them; in London there are twelve teaching hospitals, and there are other teaching hospitals in the chief cities and university centres. The status of voluntary hospitals has been changing since the war; formerly they were frankly charitable institutions, supported chiefly by contributions from the richer classes and in which the sick poor were treated; but in recent years they have become more and more supported by regular contributions from the persons who intend to use them when they are ill, especially by weekly subscriptions from work-people and savings associations, and the feeling that they are charitable institutions is becoming more and more out of date. It is now usual for persons seeking treatment at a hospital to bring a letter from their own doctor giving a history of the case and the treatment that has already been given; an almoner interviews the patient and inquires into his means in order to assess the sum that he ought to pay the hospital for treatment; and the patient is then either sent to the doctor to whom the letter from his own doctor is addressed or is seen by one of the junior medical officers of the hospital and sent on to the appropriate department. The chief feature which persists of a charitable institution is that the consulting medical staff of the voluntary hospitals do not receive any salaries or fees; on the other hand, the prestige they acquire in the medical profession through their appointment to a voluntary hospital may be worth eventually many thousands of pounds to them, though it is true that the more junior members of the consulting staffs spend laborious years in hospitals without any adequate reward; the British Medical Association, recognizing



A Hospital Ward One Hundred Years Ago. Note the single window at the end

the changing status of the voluntary hospitals, is trying to insist on the honorary medical staffs receiving a definite proportion of the money paid by fee-paying patients; but it will be a long time—if ever—before this principle is accepted generally by the hospitals or even by most of the doctors concerned, so reluctant are the latter to give up the standing that their honorary position gives them.

By the Local Government Act of 1929, local authorities—town or county councils—now control not only the hospitals for infectious diseases, as they did previously, but have taken over the former Poor Law hospitals and have the power to provide general hospitals for medical and surgical treatment, supported by the local rates. The result has been to improve the equipment and to raise the status of the former Poor Law hospitals, and in many districts the municipal hospitals are now not inferior to the voluntary hospitals; in London the new Post-Graduate Hospital, for example, is a county council hospital. They are staffed by full-time salaried doctors, with visiting salaried consultants, and the patients have to pay the cost of their treatment, except when they are too poor to do so.

The state hospitals include the Ministry of Pensions hospitals, which were set up after the war and are now gradually lessening in number, and also the hospitals for the navy, army, and air force, of which Haslar Hospital at Portsmouth and the Cambridge Hospital at Aldershot are the best known. Private hospitals in this country have in the past been mainly comparatively small nursing homes of from half-a-dozen to thirty or forty beds; but in recent years the Queen Mary Home, Edinburgh, St. Chad's Hospital, Birmingham, and the London Clinic and Nursing Home (which has over 200 beds) have been pioneers in the provision of nursing homes on hospital lines. In America nursing homes are few and it is usual to have a private block as part of the chief hospitals, and the revenue from the private block has been an important source of funds for the main hospital. More and more of the hospitals in this country are now providing private wards and private beds for fee-paying patients, who not only pay the hospital for the accommodation but pay the physician, surgeon or specialist who looks after them. This provision of private beds is likely to increase, since, for the adequate treatment of many serious conditions, it is necessary to have the elaborate equipment which is available only in a modern hospital.



Courtesy of the Princess Beatrice Hospital

A Modern Hospital Ward

HOT APPLICATIONS.—Sometimes it is useful to apply heat in some form or other to the patient. Often a hot-water bottle or several hot-water bottles will do. Rubbing the limbs with the hands or with rough towels will add heat owing to the friction which causes heat. The quickest and most thorough way of heating a patient when it can be managed is a hot bath. Hot-air baths and vapour baths are also used and electricity can be used in the form of diathermy. These more elaborate treatments by heat will be found fully described in the articles on BATHS and ELECTRICITY.

HOT PACK.—The hot pack or wrapping up in hot, wet towels is a usual part of the treatment of rheumatism. At spas and treatment centres it usually follows on a hot bath. The patient comes out of the bath and is immediately wrapped up in hot towels without being dried. After being wrapped in towels, rugs are laid over the patient, who lies on a couch for an hour or so. This treatment is of great use in promoting free sweating. If it is not possible to go for institutional treatment, a very effective hot pack can be devised at home by preparing a couch or bed in a warm room with a blanket warming in readiness and a mackintosh sheet over the couch. On emerging from the bath, without drying, wrap up hastily in the warm blanket and have someone throw other rugs over you, this should give a good result, but care must be taken to avoid a chill afterwards. Sometimes a hot pack is ordered for a bed-ridden person. The procedure then is to place a mackintosh sheet covered with an ordinary sheet under the patient, wring out a blanket that has been soaked in hot water at a temperature of about 110° F., place in a large bath towel and lay it over the patient covering up and leaving for the desired time.

HOT-WATER BOTTLE.—Hot-water bottles are so well known that it hardly seems necessary to describe them, but one or two points in connection with their use should be emphasized. The first of these is to keep a hot-water bottle handy. In cases of sudden illness, especially shock, accidents, and bleeding, whether from the lungs, internally or externally, the immediate application of heat in the form of hot-water bottles may be of vital importance in counteracting the effect of the shock and loss of blood on the circulation. In cases of sudden and severe pain such as gall-stones a hot-water bottle will be a great help in easing the pain until the doctor comes. Another point that is neglected sometimes with serious and even fatal results is the care that must always be taken in judging the heat of a hot-water bottle which is given to a helpless or unconscious person whether baby or grown-up. For a small child or baby a bottle that feels hot to the hand of a working woman will be too warm. The bottle should be tested on some delicate part of the skin which is not much exposed to extremes of temperature, such as the inside of the upper arm, the breast, etc. Always examine the bottle carefully to see that the stopper is firmly in and do not fill the bottle more than two-thirds full in case it bursts. The sleep of the young is so sound that a child will sleep through a wintry night with its bed soaked in water, and of course colds and sore throats are likely to follow such an occurrence. A removable flannel cover will keep the bottle warm for a much longer period than a bottle which is uncovered.

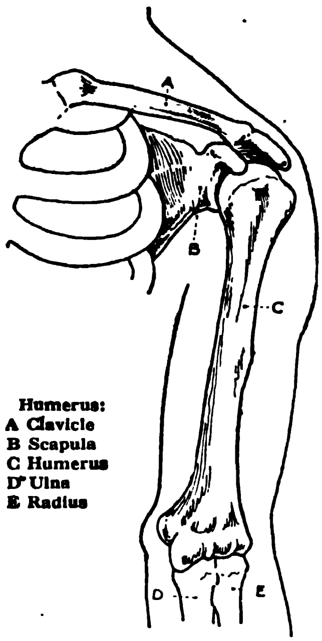
HOUSEMAID'S KNEE.—Frequent kneeling may cause a swelling to appear on the knee which usually becomes inflamed. (*See also* BURSA.)

HOUSING.—The question of housing is closely related to that of health, because of the great influence which the home has upon the health of mind and body. The influence of housing upon health is specially great in the British Isles where weather conditions force people to spend such a large proportion of their life indoors. Where large numbers of people are herded together in a small area there must inevitably be a great deal more disease of an infectious nature than in surroundings where such close contact with infected persons is not necessary. It has been amply shown too, that a definite amount of breathing space per person is needed to enable people to remain healthy, and in some of the old overcrowded districts this amount of space was not forthcoming.

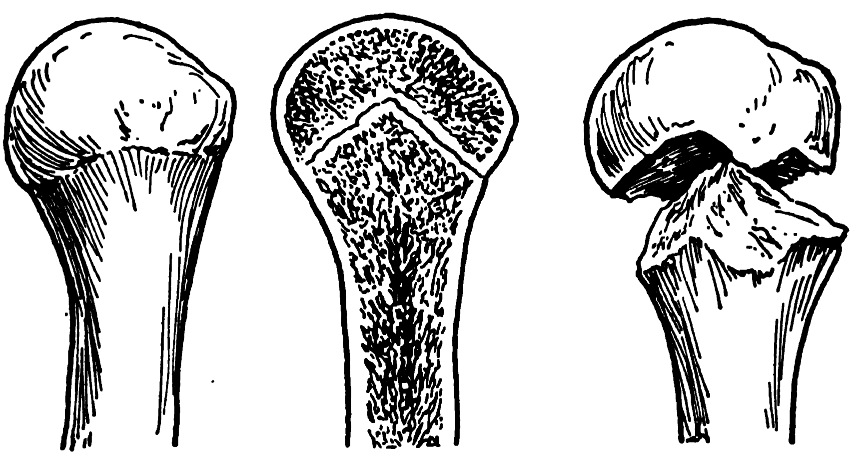
Overcrowding and lack of sunshine penetrating into the dwelling-rooms of houses and tenements are fruitful causes of tuberculosis, rickets, and anæmia, whilst damp and cold make it easy for rheumatism to gain a hold. Vermin-infested houses lead to the spread of infection from person to person.

The provision of proper housing accommodation for everyone is therefore a necessary part of the fight against disease.

HUMERUS.—The humerus is the bone of the upper arm, extending from the shoulder-blade (scapula) to the elbow joint. It fits into the hollow of the scapula called the *glenoid fossa* and forms a ball and socket joint, the ball-shaped head of the humerus turning easily in the socket of the shoulder-blade. It has the greatest range of movement of any bone of the body at the shoulder, because of the loose way it is jointed at the shoulder, but for this same reason it is very easily dislocated. At the elbow it is jointed with a hinge joint to the lower or fore-arm, and can only move in two directions, up and down. The humerus is associated with the very strong muscles of the back and shoulder and the muscles of the arm; the biceps and triceps lie in front and behind it.



Humerus:
A Clavicle
B Scapula
C Humerus
D Ulna
E Radius



Epiphyseal Line (Humerus)

HUMIDITY.—The amount of moisture in the air is referred to as the humidity. The question of humidity plays a very important part in connection with health. Too much moisture in the air prevents the evaporation of perspiration from the body, and in countries where the temperature is high and the humidity great, the body is inclined to feel heavy and depressed. (*See also* CLIMATE.)

HUMPBACK.—Humpback, or hunchback, is caused by curvature of the spine and the typical case is usually due to tuberculous disease of the spinal column (Pott's disease). The appearance of the humpback may vary from a mere roundness of the shoulders caused by standing badly, to an actual hump. Old people often become slightly humpbacked because of their inability to stand up straight, or rheumatoid arthritis may cause changes to take place in the spine. (*See also* POTT'S DISEASE; SPINE.)

HUNGER.—A healthy desire for food is known as appetite, but hunger is the stage when the appetite is stimulated to a craving for food. Usually when a person has not eaten food for a period beyond the normal meal hours, a pleasurable feeling of hunger is experienced, but this feeling may become painful if the fasting period is prolonged.

The feeling of hunger does not always

indicate that the stomach is empty, for the stomach may be full when this feeling comes on. This sensation of hunger is frequently a symptom of certain diseases. In some cases of dyspepsia, and especially in duodenal ulcer, hunger pains are felt, which are relieved when some food is eaten. In diabetes, unusual hunger is a very definite symptom, and a craving for food is also present in certain nervous diseases such as hysteria and epilepsy. In cases where it is necessary to keep the stomach empty, the feeling of hunger can be prevented by feeding the patient through the rectum. This can be carried on for several days without any discomfort to the patient. (*See also* APPETITE.)

HUNTINGTON'S CHOREA.—This is a hereditary disease of the nervous system in which the use of the muscles is lost gradually until the patient dies of exhaustion through being unable to swallow. The earliest symptoms are irregular muscular movements like those of the ordinary chorea (St. Vitus's Dance), which become worse until the patient can no longer use his hands or limbs. His mentality deteriorates and he slowly sinks into inertia and dies after a period of anything up to twenty years from the first signs of the disease. The cause and cure are unknown and it is definitely of a hereditary nature.

HYDATID DISEASE.—This is a disease in which cysts form in various parts of the body owing to the presence of immature tapeworms. The eggs of these tapeworms are almost always conveyed to human beings by dogs; usually through the dog licking the skin, or perhaps through licking the dishes from which food is eaten. The custom of kissing pet dogs cannot be too strongly guarded against.

Symptoms.—A hydatid cyst produces no symptoms while it is small, but as it grows larger, which it does very rapidly, it may cause a great deal of damage by pressing on some organ of the body. In some cases a cyst may rupture with quite serious results, or again, inflammation may occur and a deep abscess appear on the site of the cyst. In a few rare instances, the cyst which is largely made up of clear fluid along with the head of the tiny worm, may dry up and gradually disappear. In many cases a secondary cyst may form inside the first; the first being termed the mother cyst while the second is termed the daughter, or there may be a granddaughter. The outside of the cyst is usually smooth and rather like elastic to the touch. Sometimes fluctuations may be felt, or on rare occasions, what is known as the "hydatid thrill," a feeling which has been compared to a quivering jelly. The commonest sites in the body for these cysts are the liver, the lungs, the brain, the kidneys, or the heart, but they may be found in any part of the body.

Hydatid cysts occur on the liver in about 60 per cent. of all cases, and so long as they remain small, the general health is not affected. As a cyst grows larger it may cause dragging pains in the abdomen, or pressure on the stomach may cause vomiting and dyspepsia. A cyst which spreads upwards may cause compression of the lung.

Rupture of a cyst occurs quite frequently, but the seriousness of the condition depends largely on the direction of the rupture. The most common direction for rupture is into the stomach or intestine. In this case the cyst may discharge for a few weeks and finally dry up, but fatal inflammation is not infrequent. Rupture into the peritoneum usually results in a fatal peritonitis, while rupture into the lung or a bronchus may prove fatal from suffocation. Rupture of a cyst may be accompanied by shock and by urticaria (nettle rash).

Treatment.—There is no medical treatment which can be of any use in a case of hydatid cyst, but removal of the cyst by operation may be successfully carried out.

HYDRAGOGUE.—Hydragogues are substances which have the ability of inducing the body to expel water. They may act either on the intestine, on the kidneys, or through the skin. The salt purgatives such as Epsom salt and Glauber's salt are the most common substances which act on the intestines. These salts cause an increase of watery fluid to be poured out from the bowel. Drugs which act on the kidneys cause an increase of the flow of urine and so help to remove some of the excess water from the body. Other hydragogues act on the skin by producing an increase in the amount of sweat given off by the body. (*See also* DIURETIC; PURGATIVE.)

HYDRASTIS.—Hydrastis, or golden seal, is a small American plant from which a drug

called hydrastine is obtained. This drug is bitter and not unlike quinine. Given in doses of 10 to 30 grains, it is one of the best remedies in gastric disturbances due to chronic alcoholism. It is also used in intermittent fevers and as a remedy for painful menstruation. It has been used in chronic pharyngitis and in goitre. It is of value, both locally and internally, in the treatment of gonorrhœa, and used externally on the skin as a lotion it stimulates ulcers and it is especially good for cracks of the nipples.

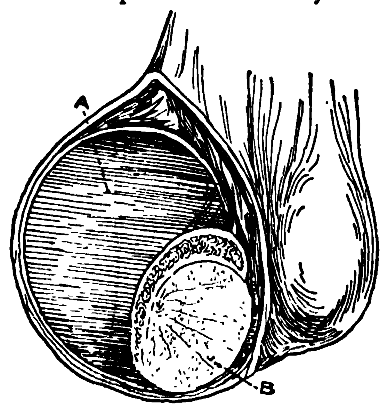
HYDROCELE.—A hydrocele is a collection of fluid near the testicle, or around the spermatic cord which comes away from it. This condition may occur in infants at birth, but it is most common in middle-aged men. In the majority of cases, there is no apparent reason for this accumulation of fluid, although some cases may be due to injury, or disease of the testicle.

Symptoms.—A swelling is slowly seen to form on one side of the scrotum, the bag which holds the testicles. The swelling may be rounded in shape, or pear-like, and the size depends on how much fluid is present. As a rule it is quite elastic to the touch, and fluctuations or wave-like motions can be felt. In the dark, by holding a light close to the scrotum, the swelling can be seen to be translucent. This test is a most useful one in distinguishing hydrocele from other swellings of a solid nature. In cases that have been going on for a long time, however, the walls of the testicle may become very thick and the transparent appearance will be lost. There is no pain attached to this condition, but a dragging sensation may be felt if the swelling has been allowed to become very large.

Treatment.—There are two courses of treatment open to a person with this condition. Either he can have the fluid drawn off by tapping, or he can have the condition cured by an operation. Tapping is done by means of a hollow needle, and as a rule, this method of treatment has to be repeated every few months. By having a surgical operation performed, the condition can be cured so that no further fluid is able to collect and form a swelling. Any person with a tendency to hydrocele should wear a special belt which keeps the scrotum supported in a small bag, and by this means the accumulation of fluid may be lessened.

HYDROCEPHALUS.—The condition of hydrocephalus, or water on the brain, occurs most frequently in children. Some cases are due to malformation before birth, but the most common cause is some obstruction of the normal flow of cerebro-spinal fluid which, therefore, accumulates within the brain. Obstructions may result from adhesions following an attack of meningitis, or from the growth of tumours near the brain.

Symptoms.—The head of an infant with hydrocephalus is greatly enlarged, and the forehead is seen to bulge and overhang the tiny wizened face. The skin is tightly stretched over the bulging skull, and the hair of the scalp is thin and scanty. There



Hydrocele:
A Hydrocele; B Testis

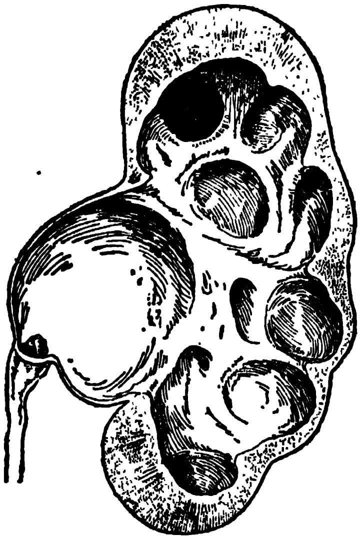
is usually considerable mental deficiency, which may amount to imbecility, and the child walks very badly, if at all.

When hydrocephalus commences late in childhood or in early adult life, the condition is much more difficult to diagnose, because the bones are more or less set and the skull cannot yield to anything like the same extent. The nervous signs are much more serious, consisting in severe headache, vomiting, neuritis of the eyes, and giddiness. During the earlier stages, before enlargement of the head has commenced, special tests can be carried out to demonstrate the presence of hydrocephalus

Treatment.—Treatment, either medical or surgical, is usually of little avail. In some cases, small doses of thyroid extract appear to be helpful. Deep X-ray treatment has also been tried. Much depends on the cause of the condition. In some cases the condition

may become arrested and the children grow up and are quite intelligent.

HYDROCHLORIC ACID.—Hydrochloric acid is a strong corrosive acid produced by the gas given off when sulphuric acid is added to salt and passed through water. This acid is present in the gastric juice in very small quantities. It is, therefore, of great value in the treatment of cases of indigestion due to the deficiency of gastric juice, for example, in alcoholic catarrh of the stomach, or gastric cancer. It is also given in small quantities to increase the flow of bile in cases



Hydronephrosis, with Stone in the Ureter

where dyspepsia is due to disorders of the liver. Large doses of hydrochloric acid will produce symptoms of poisoning including severe burning in the mouth, throat and stomach, and a general state of collapse. Lime water, magnesia, or any alkali substance should be given, followed by milk or white of egg. Emetics should not be given in cases of poisoning by a corrosive acid. (*See also* POISONING.)

HYDROCYANIC ACID.—This acid is more commonly known as prussic acid and it is found in the oil of bitter almonds. It is an extremely powerful poison, but it is used in small doses in the treatment of certain conditions. (*See also* PRUSSIC ACID.)

HYDROGEN PEROXIDE.—This is a colourless, odourless liquid which is also referred to as peroxide of hydrogen. Hydrogen peroxide when it comes in contact with the tissues of the body gives off oxygen, which accounts for its antiseptic action. Because of this action it is greatly used in the treatment of sores and inflamed wounds. When sprayed on the wound, many little gas bubbles are formed which help to remove the pus which is present. Equal parts of hydrogen peroxide and water may be dropped into discharging ears, or into an ear which has become blocked up with wax, as it helps to soften the wax and to bring away any other matter present in the ear.

Diluted with about three parts of water, it makes an excellent mouth-wash, and is very soothing to painful ulcers of the mouth. It is particularly good for cleansing the mouth during fevers, as it not only disinfects the mouth but acts as a deodorizer as well, which means that it removes any unpleasant taste in the mouth and leaves the breath fresh and pleasant.

Hydrogen peroxide has also bleaching properties which are made use of for bleaching the hair. The hair should first be thoroughly washed with soap and water, and rinsed out in a weak solution of ammonia to make sure that all the grease is removed. The hydrogen peroxide is then rubbed into the roots and hair until the desired fairness is obtained. A final rinse in plain water should complete the bleaching. A few drops on the tooth-brush will help to whiten the teeth, and is particularly good for removing the yellow stains which appear from too much smoking.

It is of great value in aiding the removal of dressings which have become stuck to a wound, and it is also useful in helping to stop bleeding. It can be used on the skin with perfect safety as it does not set up any irritation.

HYDRONEPHROSIS.—This condition is due to a blocking in the urinary passages below the kidney which causes swelling to take place in the kidney. It may be due to a stone in the ureter, to enlarged prostate, or to pressure caused by an abdominal tumour.

The only treatment is operative, which consists in removing the obstruction or in removing one of the kidneys. (*See also* DROPSY; KIDNEY.)

HYDROPHOBIA.—Hydrophobia is a very dangerous disease due to the bite of an infected or rabid dog, but other infected animals, especially wolves, may cause it.

Since the enforcement of the Muzzling Order in 1897, hydrophobia has vanished from this country, although previous to that it was not uncommon. The disease is due to a germ which is present in the saliva of infected animals, and it is by means of this saliva, which is carried into the wound made by the teeth, that the disease is given to human beings.

Symptoms.—The symptoms do not arise for some considerable time after the bite—usually about six weeks; but the time may vary from ten days to six months. The wound, which has usually healed up, begins to look red and irritable, and the patient becomes very depressed and restless. In a few days the restlessness may give way to excitement and wildness. The patient finds pain and difficulty in swallowing, and the sight of water may cause violent spasms and contractions of the muscles of the throat; hence the name hydrophobia ("fear of water"). This stage lasts about three days, and the patient is usually in a very distressed condition. Finally, complete collapse and unconsciousness takes place, and death may occur within a few hours.

Treatment.—When a person is bitten by a dog, no efforts should be spared thoroughly to disinfect the wound. If the dog is suspected to be rabid the police should be at once notified so that the animal may be looked after by the proper authorities. The authorities will then arrange for the bitten person to have the Pasteur treatment, or rather, a modification of the original treatment carried out by that great scientist in 1885. This treatment consists in inoculating the person daily over a period of at least fourteen days, with gradually increasing doses of the germ which causes hydrophobia until he becomes immune to the full strength of the germ. This treatment has been the means of saving thousands of lives, and there are now Pasteur Institutes in most countries of the world where treatment can be carried out.

HYDROTHERAPY.—The method of treating diseases by employing the waters at a spa or "hydro" is known as hydrotherapy. It includes drinking the waters and also the trea ment by baths, massage and electricity which are carried out at most spas. (*See also* BATH; BATHS; HARROGATE.)

HYDROTHORAX.—Hydrothorax, or dropsy of the pleura, is a condition in which clear fluid is found in the pleural cavity. (*See also* DROPSY; PLEURISY.)

HYGIENE.—Health is wholeness of mind and body. Hygiene is the science of health. With the ancient Greeks, Hygeia was the goddess of health, and that is where the word comes from.

We speak of the hygiene of childhood, or of pregnancy, or of life in the tropics, and what we mean is how to attain health in these conditions.

In this country matters of public health are administered by the Ministry of Health, under which hygiene is being continually studied, and local authorities have medical officers of health and health visitors. These all deal with the science of health—hygiene—put into practice.

There is also a London School of Hygiene and Tropical Medicine, where study and research in connection with health in the tropics, and also at home, is carried on.

As a matter of everyday use, the two words are often used interchangeably, and indeed it does not really very much matter which we use.

HYMEN.—The hymen is a delicate membrane which partly closes the entrance to the vagina in women. The hymen is usually broken through at the first sexual intercourse, but this cannot be taken as an infallible sign that such intercourse has taken place, since in some women comparatively slight strain such as might arise in athletic pursuits will cause it to rupture.

HYOID BONE.—The hyoid bone is a U-shaped bone situated in the neck above the larynx. The important muscles of the throat and tongue are attached to it and it serves as their support.

HYOSCINE.—Hyoscine, or scopolamine, is a drug which resembles atropine in its action on the nerves of the body, but it is more rapid and twice as strong. It is a powerful sleep-inducing drug and it is often used to quicten persons suffering from acute mania, or delirium tremens. Hyoscine and morphia are given in what is known as "twilight sleep," a condition in which the memory of the pain suffered during childbirth is entirely forgotten. This condition sounds ideal, but twilight sleep requires favourable surroundings and skilled supervision and is not always free from unpleasant after-effects. (*See also* ATROPINE; HENBANE.)

HYPERACIDITY.—An excess of acidity in the gastric juice is medically known as hyperacidity and hyperchlorhydria. (*See also* ACIDITY; HYPERCHLORHYDRIA.)

HYPERÆMIA.—The excessive flow of blood to, or congestion of, a part of the body is known as hyperæmia. When there is an increased flow of arterial blood, the condition is said to be active, and when the blood accumulates and is retarded in its return through the veins, the condition is known as passive. In any inflamed condition there is always a certain amount of hyperæmia due to dilatation of the small arteries. Active hyperæmia can be produced artificially by the application of mustard plasters, hot fomentations, or any other form of counter-irritant. Passive hyperæmia is induced by wearing an elastic bandage known as Bier's bandage, so that the flow of blood is retarded. Cupping may also be carried out. (*See also* BLISTERING; COUNTER-IRRITANTS; CUPPING.)

HYPERÆSTHESIA.—When the skin is highly aware of the slightest touch, the condition is known as hyperæsthesia. This is a common symptom in many nervous diseases, and in hysterical patients there are frequently patches of skin that are more sensitive than others. The skin over the chest, abdomen and back appear to be the most common parts. Many women during their periods, and particularly at the menopause, suffer from an over-sensitiveness of the skin. It is often noticeable that the scalp is very sensitive, and the weight of each hair may seem to cause slight irritation. Various conditions such as influenza, anæmia, rickets, and so on, may be accompanied by general or local hyperæsthesia. Under the influence of small doses of drugs such as opium, or alcohol, certain areas of skin may be more sensitive than others, while larger doses may blunt the sensibility altogether. The condition in which the merest little pin-prick feels like a violent stab is known as hyperalgesia.

HYPERCHLORHYDRIA.—This is the term applied to a form of indigestion which is caused by too much acidity in the stomach. The symptoms connected with it are particularly heartburn and chronic gastritis. (*See also* ACIDITY; INDIGESTION.)

HYPERIDROSIS.—Excessive sweating is technically known as hyperidrosis. In tuberculosis, night sweats are very common, or sweating may occur after the use of certain drugs. The parts of the body which are mostly affected are under the arms, the palms of the hands, and the feet. When excessive sweating occurs, the parts should be frequently washed and a dusting powder should be used. (*See also* SWEAT.)

HYPERMETROPIA.—This is the technical term for what is more commonly known as long sight. (*See also* ACCOMMODATION; ASTIGMATISM; EYE.)

HYPERPIESIA.—The condition medically termed hyperpiesia is more commonly spoken of as high blood-pressure, and is described under the heading BLOOD-PRESSURE.

HYPERPYREXIA.—When the temperature reaches 105·8° F., the word hyperpyrexia is used to describe the state of excessive fever. Means should be taken to reduce the temperature to a more normal state by cold sponging or the application of an ice pack. Such a state is very dangerous to life and treatment should always be supervised by a doctor. (*See also* FEVER.)

HYPERTRICHOSIS.—The growth of hair on unusual parts of the body is known as hypertrichosis. The growth of hair on the face of a woman is a very good example of this condition. (*See also* DEPILATION; HAIR, SUPERFLUOUS.)

HYPERTROPHY.—This word comes to us from Greek words meaning over-nourished, and the term is used to describe parts of the body which have become greatly enlarged. It is not always an abnormal condition, but one which may occur quite normally through various means. For example, the muscles of an athlete generally become greatly enlarged as the result of strenuous exercise, and it is quite common for the right arm of a tennis player to be larger than the left, owing to hypertrophy of the muscles. In diseases of the kidneys it may be necessary to remove one of them, and the other usually becomes greatly enlarged because of the double amount of work which falls to its lot. Hypertrophy of the prostate gland occurs in a large percentage of men over the age of sixty, and its increase in size may obstruct the outflow of urine. In the more severe cases, an operation may have to be undergone to remove the prostate gland, so as to relieve the obstruction. Hypertrophy of the muscles of the heart may cause great

enlargement of that organ. This condition occurs in the hearts of athletes, but the heart may become flabby and unhealthy if exercise is suddenly stopped, so that athletes should "tail off" with less violent pursuits. (*See also* HEART.)

HYPNOTIC.--Any drug or measure which causes sleep is known as a hypnotic or soporific. It is not advisable to rush to drugs when sleeplessness occurs as this may start a habit which is sometimes difficult to break off. Very often sleeplessness is caused by indigestion, and by avoiding eating a meal just before retiring a cure may be found without taking any drugs whatever. There are many ways of curing sleeplessness which is very often caused by some trivial thing unconsciously irritating the brain. In some cases, however, there may be actual pain which is too severe to allow the patient to sleep, and in such cases an anodyne should be given. An anodyne is a drug which relieves pain, whereas a hypnotic merely induces sleep. Of the drugs which act as true hypnotics the chief are chloral hydrate, chloralamide, bromides, sulphonal, trional, veronal, paraldehyde and hyoscine. Nowadays, mixtures of these with other drugs are commonly used. The narcotic drugs morphia, opium, alcohol, etc., also act as hypnotics, but they cause a feeling of excitement first. (*See also* INSOMNIA.)

HYPNOTISM is a condition of sleep which is artificially produced, or a trance-like state, in which the will of the person hypnotized is open to suggestions which may be made to him by the person who has produced the hypnotic state. Hypnotism has been known for many hundreds of years, and a form of hypnotism which can be produced by oneself is probably responsible for many of the extraordinary feats of endurance performed by Indians in their native land. The first physician to use hypnotism as a form of treatment was Mesmer, of Vienna, who, although he undoubtedly stumbled on a valuable method of treatment, yet was scorned because he employed much ritual and apparatus which were not necessary for the real use of hypnotism. It was left to an English doctor from Manchester, Dr. Braid, about the middle of the last century, to find out the simplest way of producing the hypnotic state. He discovered that if you make a person gaze for some time at a small bright light and suggest to him that he will sleep, telling him that this will be a natural peaceful sleep, then provided that the patient is comfortably seated, he will, within a very short time, pass into what is, for all intents and purposes, a restful sleep.

But this sleep differs from ordinary sleep. The patient is in a dreamy state yet his mind is active and he will respond to any simple commands that may be given to him. For instance, if he is told: "You cannot move your hands"; and then a moment later: "Try to move your hands," he will be unable to do so. If his arm is stroked and he is told it has become stiff, within a moment or two the limb will actually become stiff and can be placed in any position the physician chooses. The further suggestion is then made that the limb is no longer stiff, and in a couple of minutes it ceases to be stiff. It is important that exactly what is going to happen to him should be told to the patient before the hypnotic state is produced, otherwise he may really fall asleep; he must be told that the sleep into which he will pass differs from ordinary sleep in that his mind will be very alert.

There is a popular belief that a hypnotized patient is entirely under the control of the person hypnotizing him and that, for example, crimes can be committed if the physician wills the patient to commit them. Nothing could be further from the truth. No action can be suggested to a person through hypnotism which he would not carry out in his waking state. That has been absolutely proved over and over again. On the contrary, under the influence of hypnotism many people have revealed the reasons why they have felt tempted to commit certain crimes or offend the moral code in some way, and the physician has been able, by suggesting that they will never think such thoughts again, to prevent what might have led to disaster. Another popular mistake about hypnotism is that a person can be hypnotized against his will. This is quite impossible, and in fact it is difficult to hypnotize anybody unless he is not only willing but anxious to be hypnotized. Once this essential fact is grasped, it will be seen that the uses of hypnotism in treatment depend to a very large extent on the cooperation of the patient. Certain disorders of the mind, especially those which result

in physical symptoms, are the most satisfactory to treat by this method, but in many cases of incurable physical illness, pain can be relieved or even abolished by hypnotism. (*See also* AUTO-SUGGESTION; HYSTERIA.)

HYPOCHONDRIASIS is a condition of misery in which the sufferer believes that there is something wrong with his health, whereas he is, as far as medical science can discover, perfectly sound in "wind and limb." Such persons make not only their own lives, but often those of their relatives and medical advisers, miserable by constant complaints about their supposed diseases. As soon as their minds are set at rest by one physician, they discover fresh symptoms, decide that their medical attendant "doesn't understand," and seek fresh advice. These unfortunate folk live in a little hell of their own making, and it is useless to assure them that they are well; in a queer way, they "enjoy bad health." The feeling of misery and depression grows so strong in these people that they become victims of melancholia and can no longer be considered of normal mind. But the majority of those who suffer from hypochondriasis live to a good old age. (*See also* MELANCHOLIA.)

HYPODERMIC INJECTION.—The method of giving certain drugs by means of a hypodermic syringe is now largely used because of the rapidity with which the drugs are absorbed into the system, and also because the dosage can be judged with the greatest accuracy. Hypodermic injections are usually made into a part of the body where the skin is loose and blood-vessels are scarce. The upper part of the arm or the thigh or buttocks are the most common parts for this purpose. Great care must be taken to see that the syringe and the needle are strictly sterilised, and the surface of the skin must be cleansed with tincture of iodine or ether before the injection is given. (*See also* INJECTION.)

HYPOGASTRIUM.—For convenience of description it is usual to divide the abdomen into regions. The hypogastrium or hypogastric region is the lowest part of the abdomen, lying in the middle line of the abdomen, below the umbilicus and above the private parts. It contains coils of small intestine and the beginning of the rectum. When distended the bladder may protrude into the hypogastrium, also the womb in pregnancy.

HYPOGLOSSAL NERVE.—The hypoglossal nerves or twelfth cranial nerves are the nerves which work the muscles of the tongue. There are two of them and each serves one side of the tongue. They lie underneath the tongue, as their name signifies, and each is connected with one-half of the tongue so that it is quite usual for one side of the tongue only to be paralysed and the other to escape. When the whole tongue is paralysed the damage must be in the region where both nerves take their origin.

HYPOPHOSPHITES.—The salts of various hypophosphites, including ammonium, calcium, iron, magnesium, manganese, potassium, quinine and strychnine, are used a great deal as nerve tonics and appear to help the general working of the body in debilitating ailments.

HYSTERECTOMY.—This is the name of the operation for the removal of the womb, which is done for various conditions, especially such as cause prolonged bleeding from the womb, and more particularly for large fibroid tumours and for cancer. (*See also* FIBROIDS; WOMB.)

HYSTERIA is a disease, mainly of young, physically healthy women, in which there is a lack of control over acts and feelings, often accompanied by certain bodily complaints. It is important to insist that although the disease exists only in the imagination of the person affected by hysteria and although various extraordinary bodily illnesses may be imitated, yet to the sufferer these illnesses and symptoms are very real; she is no malingerer. This point cannot be too strongly insisted upon, because to treat a person suffering from hysteria as a malingerer, and to tell her to "pull herself together," is not only useless but harmful. The patient has no inkling of the nature of her trouble, and it is only by very careful and wise treatment by a doctor who has had special experience in dealing with hysteria that such patients can be permanently cured. The exact nature of the changes in the mind which underlie the development of the symptoms of hysteria are not yet perfectly understood, but much has been learnt about the condition from the work of Freud. According to his view of hysteria, the victims of it have at some time

or another in their lives suffered from some painful mental experience, which through its unpleasant nature has become forgotten by the patient, but is still stored up, buried in the unconscious mind. The natural end of such painful mental experiences is a gradual dimming of their effects by time; but if, for any reason, the impressions are not so dimmed, the memory is apt to be only buried and not destroyed. Then, given certain circumstances, in which life is difficult or not running smoothly, these memories unconsciously influence the feelings and activities of the patient. These unconscious memories often have a sexual character and may date from early childhood. ("Sexual" is here used in the broad sense as spoken of by those who deal with disorders of the mind, not in the popular, physical sense.) As a result, the mental trouble is translated into, or converted into, the symptoms of hysteria. These may be either mental or physical. The physical ones are so striking that they nearly always call attention to themselves. Sudden loss of power in one or more limbs is a very common symptom of hysteria. The patient is apparently quite helpless to walk or to feed herself. Yet the most careful examination fails to reveal any signs of disease of the structures of the nervous or muscular systems which could possibly account for such a complete paralysis. The limbs may also be held stiffly and the patient declares she is quite unable to relax them, but under an anæsthetic, for example, such limbs are freely relaxed.

All symptoms of hysteria are dramatic; they ensure that attention shall be paid to the sufferer. And there is always something to be gained from the presence of a physical symptom: the unconscious memories may choose to disguise themselves by physical symptoms, but once these show themselves the patient appears perfectly happy. It might be expected that a person who had to lie in bed all day because she was unable to walk would be depressed, to say the least of it. Not so the victim of hysteria. She has gained her object in two ways and is therefore happy: her unconscious memories have translated themselves into something which the world can see and sympathize with, and she cannot be expected to face the battle and realities of life whilst she is physically incapacitated. It must be repeated that this knowledge is not possessed consciously by the hysteric; one of the main problems of the treatment of hysteria is to get the patients to understand how their paralysis or loss of voice (another very common symptom) has come about. It is of little use to cure the symptom by suggesting that it will get well—the underlying cause for the symptom must be threshed out with the patient. After the symptoms of paralysis have been removed by suggestion as they can easily be by anyone with sufficient influence over the patient, fresh symptoms occur, either physical or mental, depending upon the particular type of patient. A most distressing, as well as a most difficult symptom to prove that it is truly hysterical, is the fit, or convulsion indulged in frequently by the unfortunate hysteric. These convulsions mimic those of epilepsy very closely, and no one except a doctor should attempt to distinguish between the two types of fit. The patient may cry out or roll her eyes about and then jerking of the arms and hands and legs begins. This may go on for a minute or several minutes and then the patient slides to the ground—she never falls so that she hurts herself; if she falls directly, she will find a soft place to fall on. This is characteristic of the hysteric, she never hurts herself. The body may be bent backwards and forwards and the most peculiar positions may be taken up; the movements of the arms and legs get more and more violent, and the patient may foam at the mouth, scream, or sob. She is never really unconscious, although she will not answer when spoken to and will deny all knowledge of what has happened during the fit. But these fits never occur when the patient is alone, or when she is in any position of danger, as do true epileptic fits. They always cease on admission to hospital if curtains are placed round the bed so that there is no audience.

One of the most puzzling of all the physical symptoms of hysteria is the loss of feeling to pain, which is almost always found in this condition. The loss of feeling is either on one side of the body, and on the corresponding arm and leg, or it is found on both arms and hands, usually to the level of the elbows. The extraordinary thing about this loss of feeling is, that a patient who suffers from it will allow a large pin to be stuck right through

her arm, and even to be left sticking in, whilst she declares she feels nothing at all—and to all intents and purposes she does not feel that sensation we call pain. But the most amazing feature of this loss of feeling is that it can be produced at any place on the patient's body by suggesting that she will not feel any pain if a pin is inserted in her flesh at a certain spot. And it can also be removed by suggesting that feeling has returned to that spot after a certain amount of stroking or patting, or whatever aid to his suggestion the doctor cares to use.

"Suggestibility" is one of the main features of hysteria. If it be suggested to a hysteric with sufficient confidence that she will be able to do a thing (as for example, that she will walk, although she may have been lying in bed for months, walk she will, after a good deal of persuasion), it is possible to get her to do it, but the underlying cause of the symptom remains and will find fresh expression in new symptoms whenever there is something in life she unconsciously wishes to avoid. The mental symptoms of hysteria are very numerous, but there is rather a characteristic nature associated with hysteria. The patient with hysteria is emotionally "up and down"; her moods change rapidly, she takes unreasonable likes and dislikes, she is either very depressed, or "up in the clouds." But her chief characteristic is a craving for sympathy. Before so much was known about the mental side of hysteria, it was treated mainly by "wholesome neglect," that is, no sympathy was shown to the unfortunate sufferers, they were scorned and told: "Not to be foolish." Nowadays the treatment is a mental treatment which goes to the root of the trouble and frees the patients from their mental "bogies."

But hysteria may imitate in its symptoms almost any physical disease and before the diagnosis of hysteria is even thought of, the most careful examinations are necessary to prove that no disease which can be responsible for the physical symptoms of the patient is present. There is one nervous disorder which occurs in young people with which hysteria is often confused, because this disorder can, and often does, cause loss of power in one or other limb for a short time. This disorder is disseminated sclerosis, and it is specially important to avoid such a mistake occurring because the type of young person who is attacked by disseminated sclerosis is often the same type, good-looking, charming and usually plump, as shows the physical symptoms of hysteria.

If by unwise treatment of a physical symptom in hysteria this symptom has been cured and no further trouble has been taken with the patient's mental worries, it is likely that she will find a way out of these by a mental process of some kind. These are extremely varied in nature, but they all realize the same desired end, namely, an escape from reality. One of these consists in a wiping out of a certain length of time for the patient. She remembers nothing of what has happened to her for a definite period of minutes, hours, or even days or months. The patient may be aware that she lost herself at such and such a place and at a certain time. She may find herself at a wholly different place and be quite unaware of how she got from one place to the other. In these states the patient may wander for miles and carry on perfectly sensible conversations with others without revealing anything wrong with her. The "second personality" may be quite able to carry on the patient's affairs for a while without anything amiss being noticed.

It is interesting that this form of "escape" from reality which results in these failures of memory with the development of a "second personality" capable of carrying on a patient's affairs is much more common in men who suffer from hysteria than in women. It must not be thought that hysteria is only seen in women: it may be present in men, especially in those who have a family history of nervous or mental trouble, and it may also occur in children, in whom isolation in a hospital ward is almost essential for any hopes of cure. In adults, the frank discussion of their mental troubles with a doctor almost invariably reveals the underlying cause of the hysterical symptoms and should result in cure. (*See also* DISSEMINATED SCLEROSIS; FREUD.)

HYSTERICAL or SELF-PRODUCED DERMATITIS.—This occurs in two classes of persons: malingerers, who are generally men, and hysterical patients, who are often girls in their teens or early twenties.

The first group are either incorrigibly "work-shy" or are trying to get compensa-

tion fraudulently. They more often try to increase, or at least prevent, the cure of a skin disease that already exists, than create a new one. Such cases are often very puzzling at first sight; but a medical man is soon rendered suspicious by a dermatitis which persists in spite of suitable remedies, and shows features strange to the disease.

The patients comprising the second group, which is by far the larger, are a most interesting type. In many cases they appear to be normal in every way; not specially excitable, far less showing the signs commonly spoken of as "hysterical." They are hardworking, in good general condition, and with plenty of healthy interests suited to their age. Indeed, in very many cases the patient appears to be an exemplary type; she can produce a "character" from her parents, teachers, or pastor which is unassailable. However, on examination she always shows one unfailing hysteric sign, anæsthesia of the soft palate. When the roof of the mouth towards the back is touched, she shows no sign of discomfort, whereas a normal person "hawks" and coughs.

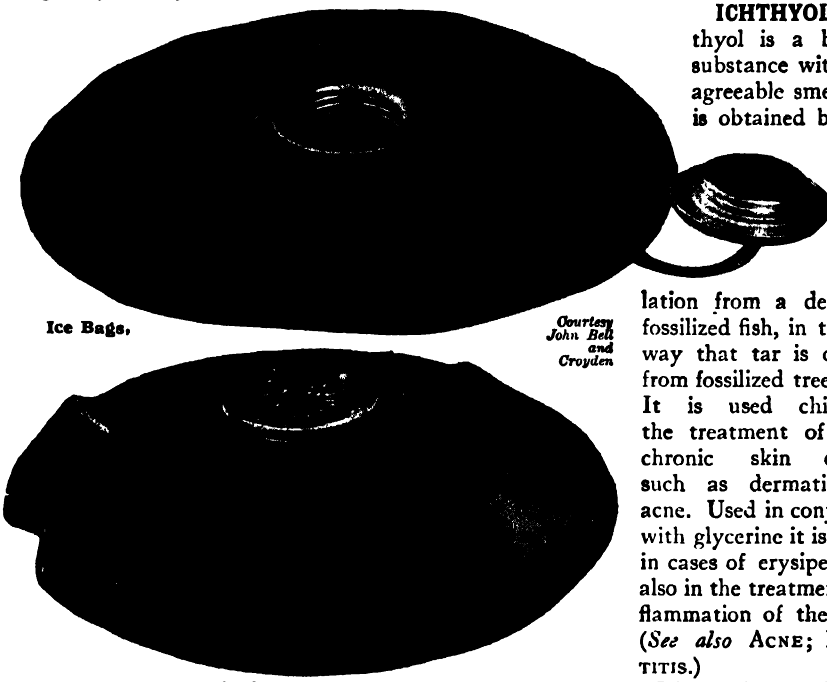
The injuries produced on the skin are generally recognized by a trained person as being artificial. They do not resemble any known disease of the skin; they are always made on parts of the body within reach of the right hand (or left, if the patient is left-handed), and very, very rarely are seen on the face. They end abruptly in normal skin, instead of fading away into it. They may smell of carbolic acid, ammonia, and other such substances, which may make the doctor suspicious; though the patient often tries to put him off by saying that the odour is due to the dressing used. Various methods have been used to produce the "disease": acids such as carbolic or nitric, tartar emetic, burning matches, saliva and rubbing, pumice stone, pocket-comb, tooth- or nail-brush—the last often combined with a chemical. In many cases, an accidental injury from one of the chemicals mentioned, and the resulting sympathy has apparently suggested the idea to the girl. A more puzzling type of case occurs when an hysterial patient becomes afflicted with a skin disease and aggravates this by methods of her own.

The patients show the most extraordinary ingenuity in hiding their "weapons," even when their skin trouble is known to be self-produced, and their attendants are on the look-out. Sir Norman Walker, the noted skin specialist, records a case where, he says, a patient "successfully concealed for three weeks in my ward the supply of carbolic acid with which she produced the lesions, although we were on the hunt for it during the whole of that period." One case of the writer's was that of a girl of twenty-two, in a domestic training home. The lesions were on the backs of both hands and forearms, and between the fingers; they occurred as peculiar sodden-looking, elongated ulcers.

The girl appeared perfectly normal, and, indeed, expressed annoyance about her "trouble," and appeared very anxious to be back at her work. The insensitive palate, however, "gave her away," and (as for some reason she could not be sent to a hospital) the very capable and intelligent matron of the home was warned to be on the watch, the girl having been searched and isolated. Meantime the patient, who in addition to being a quick and conscientious worker was a highly religious girl, spent more time than ever over her Bible—so much so that the matron's suspicions were aroused. She examined the book privately and found hidden in the back a small supply of oxalic acid (salts of lemon), which was used in the laundry of the home, and a piece of broken comb! After this discovery, the skin "disease" soon disappeared, the girl, however, protesting her innocence to the end.

Treatment.—The treatment of these cases is, whenever possible, to send the patient to a hospital or nursing-home. Not every case is by any means so easy of discovery as the one just recorded, and when, in addition, the girl is living with patients or friends, they are only too anxious to believe her statement, and disbelieve the doctor. It is merely a waste of time to have her treated at home. "Such patients," says Sir Norman Walker, "must be stripped stark naked, they must be left with not even a handkerchief to weep into, and put in a bath where they must be watched, while their room and belongings are searched with the thoroughness of a Sherlock Holmes." When the cause has been discovered, the patient should have a long and thorough general hygienic treatment, preferably in entirely new surroundings, before she can be regarded as entirely normal in body and mind once more.

ICE AND ICE-BAG.—The value of ice is being more and more realized nowadays as a means of keeping foodstuffs fresh. Not only does it make food taste more palatable, but from the health point of view the use of ice cannot be too strongly recommended. When there are children to be fed on milk during the hot weather it is important to see that it is absolutely fresh and clean, and for this purpose the use of an ice-box will be found very helpful, being very nearly as efficient, and much less expensive to install than a refrigerator. Apart from the importance of fresh food, ice is very useful in the treatment of various diseases. In cases of fever it is sometimes necessary to give cold applications, and these can be carried out most conveniently by placing chopped ice in what is known as an *ice-bag.* The bag is made of rubber and is closed by a screw cap. As a rule a piece of flannel is placed between the bag and the skin, and in cases of emergency an ice-bag could be manufactured out of a rubber sponge-bag so long as the top was tied together with a piece of string. When there is any internal bleeding from the stomach or throat, or in cases of inflammation of the throat or mouth, small pieces of ice should be given to the patient to suck, a fresh piece being given as each bit melts. Ice sucked in this way may help to relieve vomiting, and sipping iced soda water is equally as good. Severe headache and delirium are often relieved by placing an ice-bag over the forehead. Pain is usually relieved in the abdomen or elsewhere by a cold application, and in cases where the patient is unable to bear the weight of an ice-bag on the body, the bag should be suspended from a bed cradle. (*See also* HÆMORRHAGE.)



Ice Bags, *Courtesy John Bell and Croyden*

ICHTHYOL. — Ichthyol is a brownish substance with a disagreeable smell which is obtained by distillation from a deposit of fossilized fish, in the same way that tar is obtained from fossilized trees (coal). It is used chiefly in the treatment of certain chronic skin diseases, such as dermatitis and acne. Used in conjunction with glycerine it is applied in cases of erysipelas, and also in the treatment of inflammation of the womb. (*See also* ACNE; DERMATITIS.)

ICHTHYOSIS.—Ichthyosis, or the fish-skin disease, is so called because those suffering from it have a dry scaly skin somewhat resembling that of a fish. All varieties may be seen (the mildest fortunately being the commonest), from a mere dryness of the skin to cases where the patient is covered with "large horny masses, and the skin resembles rather that of a reptile."

Treatment.—The treatment consists in supplying to the skin the fat which it so sadly lacks; the patient should take a daily bath, and afterwards grease himself thoroughly with lanolin, almond oil, etc. A diet rich in fats is also recommended.

ICTERUS.—The word icterus is just another name for jaundice, the yellow

colouring of the skin and "whites" of the eye caused by the presence of bile in the blood. *Icterus neonatorum* is a form of jaundice found in newly-born babies. It usually wears away in a few days, but if it does not do so it may be due to some defect in the child or to congenital syphilis, or some other septic condition due to infection through the umbilical cord. (*See also* JAUNDICE.)

IDIOCY is a condition of imperfect development of the brain which exists from birth, and which is so marked that the sufferers therefrom are unable to protect themselves from the common dangers of life. As long as they live they have to be looked after and protected like young children. Fortunately, idiots (as those afflicted with idiocy are called) rarely live to a very old age and the worse types die before they reach adult age. It is sometimes asked how an idiot can be distinguished from a child who is merely "backward." Apart from the fact that idiots are usually badly formed physically, it may be said that whilst a backward child is merely younger in mind than the normal child of the same age, the idiot would be abnormal in mind at any age. But idiots show by their vacant expression, their enormous ears, the way their heads roll about, their entire lack of sensible speech, that they will never be capable of normal life. Many of them show queer movements of the arms and legs, which they repeat over and over again, or they may make extraordinary noises, which may be interpreted as attempts to talk. It is difficult to train such beings to be clean in their habits, and this is one of the great trials in dealing with these unfortunates. There are many different types of idiocy, of which only two need special mention here. One is the Mongolian type, so called because they have the slanting "almond-eyes" like a Chinese. The children with this form of idiocy are often the last of a large family. These children differ from the ordinary idiots in being trainable to a certain extent. They are very fond of music, and will beat time to a rhythm and can be taught to play the simpler musical instruments. They are also very quick to imitate any actions they see, and therefore do well in institutions where they can copy those whose sole duties are to train them to make the best of their limited brain power. Mongolian idiots do not often reach adult life because they are very liable to chest troubles and have little power of resistance.

The other form of idiocy is of great interest, because it is the one form which, if taken in time, is capable of great improvement, if not of complete cure. This form is cretinism, and is now known to be due to lack of the thyroid gland, that little gland situated on either side of the windpipe. The children who suffer from cretinism are dwarfs, and enormously fat. Their arms and legs are short and the skin is dry and thick. They have very little hair, and walk in a clumsy, waddling fashion. Speech consists of a few words, spoken in a squeaky, harsh voice. The effect of giving these children the correct treatment, which is large doses of thyroid gland by mouth, is often little short of miraculous. They lose their fatness in a remarkably short time; they grow quickly and cease to have a dwarf-like appearance, and their mental state improves also, though the amount of improvement can never be prophesied in any particular case. In some cases the mental state becomes almost normal; this applies particularly to those cases in which the condition has been recognized and treated at an early age. In others, the brain power never develops above that of a feeble-minded child. (*See also* CRETINISM; MENTAL DEFICIENCY; THYROID GLAND.)

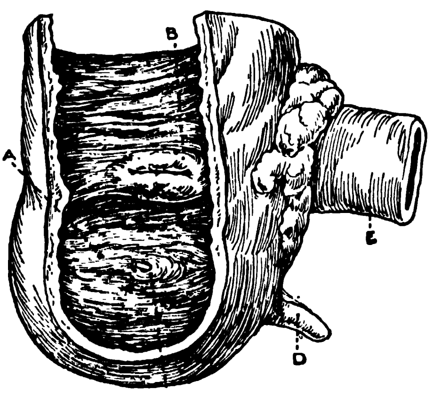
IDIOPATHIC.—Idiopathic is a word used in medicine to mean a disease or symptom, for which no cause can be recognized. It is peculiar to the disease, or to the person.

IDIOSYNCRASY.—By idiosyncrasies we mean individual peculiarities of constitution or temperament. Some people are more or less violently upset by contact with ordinary substances which do no harm to the majority of their fellow human beings, as for instance, people to whom such common articles of food as milk or eggs act as a poison, bringing on one of the diseases which are now known as *allergic* diseases, i.e. hay fever, asthma, migraine and urticaria (nettle-rash), etc. These people are said to have an idiosyncrasy for the substance which harms them. It is very common for patients to have an idiosyncrasy in connection with some particular drug, as for instance, a violent headache may follow the taking of quinine, etc. (*See Also* ALLERGY; ANAPHYLAXIS.)

ILEO-CÆCAL VALVE.—The last part of the small intestine before it joins on to the large intestine (colon) is called the *ileum.* The blind end of intestine called the cæcum joins on at this point, and the ileum acts as a valve at the entrance to the cæcum in so much as it allows the contents of the small intestine to flow in one direction, i.e. into the cæcum only. This is called the ileo-cæcal valve.

ILEUM.—This is the name given to the lowest part of the small intestine or bowel. (*See also* INTESTINE.)

ILIAC REGION.—The abdomen is spoken of as if it were divided up into compartments



Ileo-Cæcal Valve:
A—Cæcum C—Opening into Appendix D—Appendix
B—Valve E—Ileum

to simplify descriptions of symptoms, etc. The two iliac regions are the two lowest parts of the abdomen on the right and left and are so called because they lie in front of the *iliac bones*, or iliac crests as they are also called. These iliac bones are the two wing-like crests at the back of the haunch-bones. The cæcum and the appendix lie in the right *iliac fossa*, and pain is felt there when they are inflamed. Pain in the iliac fossæ in women is often due to some derangement of the female reproductive system. (*See also* ABDOMEN; GROIN.)

ILIUM.—The ilium is the haunch-bone. It is also called the innominate bone and is described fully under the heading INNOMINATE.

ILLEGITIMACY.—It is a very noticeable thing that the death and sickness rate is far greater amongst illegitimate children than amongst the children of married parents. People have tried to attribute this to all sorts of reasons such as inherent weakness at birth and so forth, but the fact remains that the illegitimate child is exactly the same as the ordinary child, but lacks care and attention in so many cases. The subject has been dealt with in the SUPPLEMENT ON CHILD WELFARE.

ILLUSION.—Illusions, hallucinations and delusions are all states in which a person misinterprets facts, and believes in his misinterpretation. The three misinterpretations differ in form. Take the case of ghosts. To see a man crossing the garden path in the twilight and mistake him for a ghost is an *illusion.* To think you see a man crossing the path when there is no one, there is a *hallucination.* To see a man crossing the path and *believe* that he is a ghost is a *delusion.* Illusions are harmless mentally. They are in fact merely mistakes. Hallucinations are often harmless but are sometimes signs of mental disorder, and delusions are definitely signs of mental abnormality. HALLUCINATIONS and DELUSIONS are described under their own headings.

IMBECILITY.—A form of feeble-mindedness similar to that of idiocy, but as a rule an imbecile shows a greater degree of intelligence. (*See also* IDIOCY; MIND.)

IMMUNITY.—In the medical sense, immunity refers to the powers that certain animals and men have which make them insusceptible to various germ diseases. Animals vary in their immunity to different germ infections: the dog and the domestic fowl, for example, are quite immune to anthrax and lockjaw, that is, they never have these diseases. Even amongst different races of mankind there are great variations in disease-resisting powers: the negro races are relatively insusceptible to malaria and yellow fever, while, on the other hand, smallpox is an exceedingly fatal disease amongst them. Immunity is therefore a relative term. It varies according to the conditions of the environment. Two kinds of immunity are described, *natural* and *acquired:* the former is inherited, the latter develops during the lifetime of the individual.

The normal blood contains substances which are hostile to germ life and so tend to protect against disease. Everyone knows that certain people when exposed to infection do not contract the disease. This is due to

those protective qualities which constitute "natural" immunity. It is also well known that one attack of an infectious disease protects against another attack of the same disease. In such cases, an "acquired" immunity has been developed. This response on the part of the blood can be artificially produced and used to prevent possible infection. In the case of "vaccination," a mild attack of smallpox is induced and the protective powers of the blood are so stimulated by it, that immunity to smallpox is obtained. Such an acquired immunity is not permanent, hence the need for re-vaccination. Vaccine treatment is simply the injection into the blood-stream of dead germs with the object of increasing the resistive powers of the blood to these special germ infections. Vaccines are commonly used to prevent typhoid, paratyphoid and cholera.

In the body, germs produce their harmful effects by manufacturing poisons (toxins), but the blood counteracts this by producing an antidote or antibody. It is the formation of such substances which enable a person to recover from an attack of a certain disease, and it is their persistence in the blood in some quantity which gives immunity against further attacks of the same disease. It is possible to produce anti-poisons, or, as they are called, antitoxins, for diseases such as diphtheria and lockjaw and, by injecting the antitoxins into the blood of a sufferer, the disease is greatly diminished in severity. This is termed *passive* immunization as opposed to the *active* immunization of vaccine treatment.

The blood possesses other defensive powers against harmful germs. In the fluid part of the blood, there are substances called *bacterio-lysins* which are hostile to germs. Also, invasion by germs stimulates the *agglutinating* power of the blood, by which the invading germs are rendered immobile and are clumped together so that their activities are impeded. Again, the white cells of the blood eat up foreign germs: they are called phagocytes and they only act when substances called *opsonins* are present in the blood. The activity of the phagocytes is therefore said to depend upon the *opsonic index*. It is clear that immunity to germ infection is dependent upon a *number* of factors and the most important of these, so far as natural immunity is concerned, is the germ-eating powers of the white blood cells, or *phagocytosis*. (*See also* ANTITOXIN; BLOOD; GERMS; LEUCOCYTES; SERUM.)

IMPERFORATE.—The word imperforate means without an opening, and in medicine this term is most commonly used in connection with the anus. It sometimes happens that a child is born with no opening through which the contents of the bowel can be discharged, and if no action of the bowel occurs within twenty-four hours of birth, the anus should be examined and the matter can usually be put right by a simple operation. (*See also* ANUS.)

IMPETIGO.—Impetigo is a common and very easily spread skin disease, in which pustules (festering spots) appear on the face and scalp and sometimes on the other parts of the body. It is extremely catching and may run rapidly through a family or school. It is most common in children and young adults, and is chiefly found in dirty neglected children, though no class of people, however cleanly, are exempt from it. It very frequently accompanies lice on the head or body, and is probably carried by them from child to child. A running ear has often been noted before the appearance of impetigo, and in this case it is probably the same germ that causes the two conditions.

Symptoms.—Little red patches appear first on the skin of the face or head, which turn into watery blisters. The fluid in these blisters turns yellowish and they break, leaving yellowish scabs, surrounded by a reddish ring. As these rings may run into each other and cover large tracts of the face the condition can be most unsightly, but fortunately the scabs do not leave permanent scars. On the scalp the disease spreads even more quickly than on the face, and as the hair is all mixed up with it the picture is soon a horrible one. The blisters burst and discharge thick, sticky, and foul-smelling pus into which the hair is matted and bound down by the crusts.

Treatment.—Impetigo is a very simple disease to treat, but the most important thing is to get treatment started quickly. Washing and shaving, or hair combing or brushing must be forbidden as the infection is so rapidly spread by these means. The only thing that can be done is to facilitate the drying up of the crusts, which is best done by the use of a good drying powder, or

a lead and spirit lotion. Powders that can be used are boracic, zinc, or talcum. A preparation that combines both the lotion and powder treatment and is easy to use is a thick calamine lotion. Paint on and leave to dry, renewing at intervals. See that the child does not pick the scabs, but that they are allowed to drop off when they are ready.

Impetigo on the Scalp.—Impetigo on the head is much more difficult to deal with. If the condition is very bad it may be necessary to cut off the hair in the case of a girl. If, however, there are only a few spots widely separated this will not be necessary. It will be sufficient to clip the hair short in the region of the spots. Powders and calamine lotions are not suitable for the head so a spirit lotion must be used; one with mercury being the best. When the crusts are dry on both the face or the head they can be softened by the use of a mercury ointment and this will make them ready to come off sooner. (*See also* DERMATITIS.)

IMPOTENCE.—In the medical sense is used to denote lack of sexual power in the male. It is to be distinguished from sterility and lack of desire. Impotence means that a man, though he may desire sexual intercourse, is unable to carry out or complete the sexual act. There are many causes for this condition, some permanent, others temporary. Any exhausting illness such as chronic kidney disease and diabetes, diseases of the spinal cord, such as locomotor ataxia, and the excessive use of alcohol or drugs of the morphia class will tend to produce impotence. Deformity of the sexual organs, either inherited or from disease, is liable to prevent complete sexual gratification; while excessive intellectual work may cause a temporary loss of power. Sexual overindulgence leading to exhaustion is a common cause of impotence, but the commonest cause is a psychological one, a mental conflict often due to subconscious guilt feelings related to masturbation (self-abuse) in early life.

Treatment naturally depends upon the cause. Impotence from physical or mental exhaustion will quickly disappear under the influence of rest and tonic medicines. Alcohol must be avoided and tobacco cut down to a minimum. Psychological impotence will be benefited by a period of abstinence from all attempts at sexual intercourse, and by leading a vigorous, out-of-door life, with the mind fully occupied with useful work and recreation. If such measures fail, it will be necessary to consult the doctor. Only in a few cases will aphrodisiac (sex-stimulating) drugs be necessary, and these should be taken strictly under medical advice only. Most of the alleged remedies on the open market are useless and some are harmful. (*See also* SEX HYGIENE.)

INCISION.—This is a term which is used in surgery. It is applied to a cut or a wound.

INCISOR.—The four front teeth of each jaw are called the incisors. (*See also* TEETH.)

INCOMPATIBILITY.—When substances do not mix together they are said to be incompatible. Very often certain drugs undergo chemical changes when they are mixed with other drugs, or their actions may be opposed to one another, in which case incompatibility is present and these drugs would be unsuitable in prescriptions.

INCONTINENCE.—Means inability to control the passage of urine from the bladder, or fæces from the rectum (back passage). It is sometimes used to denote sexual intercourse outside marriage (the opposite of continence). Very young children up to about twelve months, cannot control the bladder and rectum at will, but gradually from that time a voluntary control is established. In children and some nervous adults, a sudden fright or shock may induce the urine to be passed involuntarily, and in certain diseased states, notably those affecting the spinal cord, these symptoms may arise. The passing of urine is a reflex controlled by the mind and is dependent upon the healthy state of the nervous system. In locomotor ataxia, the spinal cord is diseased and the reflex may be lost. In consequence, the bladder gets distended and overflows, this being known as "overflow incontinence." In some spinal injuries, the bladder empties itself on the slightest provocation—"reflex incontinence," while in some cases the bladder will not retain any urine, but allows it to flow away immediately—"dribbling incontinence."

Incontinence of fæces may occasionally occur in nervous children under strain, but in adults it may arise as a result of injury or disease of the brain or spinal cord or as a sequence to injuries or operations on the rectum. This symptom may also arise during the unconsciousness (coma) which often accompanies severe diseases. Should the

rectum be removed by operation, as in cases of cancer, incontinence of fæces is inevitable, but much can be done to control this unpleasant symptom by special attention to the diet and the drinking of fluids. (*See also* BEDWETTING; BLADDER, DISEASES OF; DIARRHŒA; ENURESIS.)

INCUBATION.—The incubation period of any disease is the time which passes between the actual infection and the first appearance of its symptoms. In most of the infectious diseases this period remains fairly constant in each case; for example, in measles the incubation is generally around 14 days; while in diphtheria, about 2 days is the usual time. It is important to know the various periods of incubation, as a watchful eye can be kept on any suspected person during this time and further spread of the disease may be avoided. The average incubation periods of the more important infectious diseases are as follow:

Disease	Incubation Period
Chicken-pox	10–16 days
Diphtheria	2–4 ,,
Erysipelas	1–3 ,,
German Measles	14–17 ,,
Influenza	1–5 ,,
Measles	10–14 ,,
Mumps	18–21 ,,
Scarlet Fever	2–3 ,,
Smallpox	12–14 ,,
Typhoid	10–21 ,,
Whooping Cough	10–14 ,,

INCUBATOR.—An apparatus used for the artificial hatching of eggs is known as an incubator. Prematurely born or very delicate babies are sometimes reared in an incubator in which the temperature is so regulated as to maintain the desired level. Incubators are also used in laboratories for the growth of germs or bacteria.

INDIAN HEMP.—This is a species of the common hemp which grows in the East and is known also as *cannabis indica*. It is a powerful poison to the nervous system, but it varies in its effects to a great extent. In some people it has a sleep-producing action, while in others it excites the brain and may produce vivid hallucinations (visions). It is taken by the peoples of the East either by smoking, eating, or drinking, for the purpose of producing pleasing sensations, sometimes amounting to an intoxication. In the East it is called hashish, and the hashish habit once established is very difficult to break off. (*See also* CANNABIS INDICA; HASHISH.)

INDICAN.—This is a substance which is present in the urine in normal people, but is increased in amount when putrefaction is going on in the bowel. Its presence in the urine in large amounts therefore means that there is marked constipation or even intestinal obstruction.

INDIGESTION.—This condition may be defined as one in which discomfort, distress or pain is felt in the abdomen (belly) during or after a meal. It is also referred to as dyspepsia and it is distinguished as the commonest of all the ailments of civilization. Most commonly, indigestion is associated with actual disorder of the stomach or bowels, but dyspeptic symptoms may arise during the course of many other diseases.

Causes.—Overworking of the digestive organs is one of the most frequent sources of indigestion. Large and elaborate meals, if habitually eaten exhaust the glands of the stomach and weaken its muscular walls, causing dilatation of that organ. Constipation is inevitably associated with indigestion, and this further induces mechanical changes which handicap the whole digestive apparatus. Pain in the pit of the stomach is the familiar symptom which arises from the dyspepsia of constipation.

The food is often eaten too hastily, with the result that it is imperfectly chewed and mixed with saliva so that additional work is thus thrown upon the stomach. Upsetting the natural rhythm of the stomach by taking meals at irregular times is harmful to good digestion, as is also the bad habit of eating between meals. The stomach requires rest pauses just like the other vital organs. Also, eating between meals spoils the appetite and without the stimulus of appetite a meal is poorly digested and assimilated. Tea or coffee when too strong, and when taken to excess, have an astringent and irritating effect upon the lining of the stomach, diminishing the flow of juice and causing digestive trouble. Abuse of alcoholic liquids acts in the same way. Any sepsis (or poisoning) arising from the gums, teeth, tonsils or nose, is apt to cause indigestion owing to the constant swallowing of poisonous matter. Worry and anxiety by preventing the free flow of the stomach juice readily lead to dyspepsia.

Indigestion is more accurately to be described as a symptom and not a disease, and each case requires careful investigation to determine what is causing it, and the precise nature of the disorder. One type of indigestion is associated with a functional disturbance of the stomach, i.e. there is some breakdown in the digestive mechanism without any structural defects. Too much acid or too little acid may be secreted by the stomach glands (hyperchlorhydria and hypochlorhydria.)

Another type is associated with actual disease of the stomach or duodenum, such as dilatation, inflammation (gastritis), and ulceration and cancer.' Severe pain immediately on taking food, along with sickness and nausea and tenderness over the stomach region, is very suggestive of stomach ulcer. Pain coming on an hour or two after a meal —often with a feeling of hunger, and therefore called "hunger pain"—is generally indicative of a duodenal ulcer.

Indigestion may also arise in connection with liver, gall-bladder, heart, kidney, appendix and lung disease. The diagnosis in this type is often difficult, as is also the case where mental causes, neurasthenia and hysteria, are the underlying factors.

Prevention.—Eat such foods as will prevent constipation, i.e. those containing vitamins, mineral salts and roughage. Do not worry or attempt any serious mental work at the table. Eat slowly, masticating the food thoroughly, and do not wash it down with mouthfuls of water. Be sparing with all condiments. See that your tea is properly infused—not stewed. Never take undiluted alcohol on an empty stomach. Be moderate with smoking, otherwise the appetite may be affected. Be careful with the hygiene of your mouth and throat. If in doubt consult the doctor. Treat your stomach to an occasional fast. This last piece of advice is probably the most valuable of all. (*See also* APPETITE; HUNGER; SUPPLEMENT ON DIET.)

INDUSTRIAL HYGIENE.—It is now being recognized that in order to do one's best work good conditions of working must be enjoyed. A tired or sick worker will not do as good work, or as much work, in a given time as a fresh and fit one. This applies to the mind as well as the body. The best work is done by contented and happy people. A good deal of attention is now being given, therefore, to the problem of fitting the worker to his work, keeping him happy while there and looking after his bodily fitness. Certain conditions which must be fulfilled by the employers of labour in factories are laid down by law and inspectors are appointed to see that they are carried out. Works are made as safe as possible for those who work amongst machinery, and a sufficient supply of fresh air is provided by ventilation schemes. First-aid boxes are installed and often nurses are in attendance. Lighting is adapted to the work that is to be done by its aid. It is not always possible to ensure that the temperature of the room is comfortable, as so many industries require heat and a few are carried on at low temperatures. The whole business of making conditions of work such that the best physical and mental results will be got from the workers is fast becoming a special science under the name of Industrial Hygiene. (*See also* HYGIENE.)

INFANT FEEDING.—The proper diet for infants will be found in the SPECIAL SUPPLEMENT ON BABY at the end of the book.

INFANT MORTALITY.—The infant death rate is calculated as the number of infants per 1,000 registered births who die in the first year of life.

It can be seen from contemporary documents that in earlier times the infant death rate was frightfully high. One noble family, the Colets, in the 16th century records the birth of 23 children, 22 of whom died in infancy or early childhood. It is certain that if the wealthy suffered to such an extent, other classes would not escape. Even in the 19th century it was far from uncommon in the poorer classes for the birth and death of an infant to be registered at the same time. Since the introduction of measures of social reform, however, the infant death rate has steadily declined; for instance, the Ministry of Health report for 1930–31 states that "the average rate of Infant Mortality during each of the past four decades is 153, 128, 100, and 68." In some places, notably New Zealand, the infant death rate is even lower; in 1912, our rate was 95, while theirs was 48 per 1,000 births.

Under the best circumstances, some loss of infant lives is unavoidable, and so far we cannot calculate this loss. Avoidable general causes, however, are now well known to any

thinking person. The chief are ignorance; carelessness; poverty; dirt; bad feeding; sanitation and air; infectious diseases; and lack of skilled care before and at confinement. Unless very heavy work is done, the industrial employment of women before confinement does not increase the infant death rate (as was seen during the war).

The chief special causes of infant mortality are debility, wasting, congenital defects, prematurity, diarrhœa, convulsions, accidents (including overlaying), bronchitis and pneumonia. Seventy per cent. of infant deaths are due to the above; 29 per cent. being due to prematurity and congenital defects, and occur during the first four weeks of life.

The infant death rate is highest in districts having a high birth rate (probably due to the fact that the highest birth rate occurs in poor class communities); higher in the town than in the country, owing to poorer health conditions; and among illegitimate children double that of the ordinary rate.

INFANT WELFARE.—This important subject is included in the Special Supplement on Child Welfare, which will be found at the end of the book (page 765).

INFANTILE CONVULSIONS. — Convulsions in infants, that is, in children under the age of 2 years, must be looked upon in quite a different light from convulsions or fits in adults. They may not mean very much, or they may be of serious importance, and in any case they require the advice of a doctor. Many fevers in children, such as whooping-cough or measles, may begin with a convulsion, or they may be due to such minor ailments as teething, over-feeding, indigestion, constipation, or intestinal worms. On the other hand, convulsions may be a symptom of rickets or of some serious venous disorder. These convulsions are generally caused by some weakness of the nerve cells which may be inherited from the parents, or which may develop after birth. The children of parents who suffer from some nervous disorder such as hysteria, alcoholism, insanity, etc., are very liable to be subject to convulsions. In cases where the system becomes poisoned, for example, in diseases of the kidney, convulsions may follow as a result of the poisoning.

Excessive or unsuitable diet, such as a highly indigestible meal of coconut or



Investigating the effect of vibrations on a man using a road drill; at the London School of Hygiene and Tropical Medicine

unripe fruit may induce convulsions in a healthy child, but it should be remembered that convulsions, apart from those caused by serious brain or other disease, are rarely due to irritation alone, and even when they appear to be so, there is often an additional factor in the shape of nervous excitability either hereditary or acquired as a result of lowered health. Other common causes of irritation are an adherent foreskin or obstruction to the air-way by tonsils and adenoids.

Asphyxia or severe hæmorrhage may cause such a loss of oxygen in the body that the nerve cells become weakened, and the result is seen in convulsions.

Symptoms.—Typical convulsions begin with a dazed look, followed immediately by momentary pallor and dilatation of the pupils of the eyes. The head falls forward, or the child sinks to the ground and becomes unconscious. Breathing is irregular; there is frothing at the mouth, and the contents of the bladder and bowel may be passed. The attack may be over in a few seconds, or last for hours with intermissions. They are nearly always followed by a period of more or less profound sleep.

"Premonitory" symptoms are rather rare; the so-called "inward convulsions" in which the infant moans, draws up its legs, distorts its face and clenches its fists, are merely signs of colic.

In early infancy frequent attacks of petit mal (minor epilepsy) consisting of momentary pallor, dilatation of the pupils, drooping of the head and loss of consciousness, suggest "fainting" or heart disease rather than epilepsy. There is no difference between the symptoms of infantile convulsions and epilepsy.

The outlook, as far as life is concerned, is usually good. Convulsions themselves are rarely fatal. With regard to recurrences, if there is an obvious cause, such as gross overfeeding, or intestinal inflammation, the probability is that the fits will cease if these causes are attended to. Where there is no real cause, e.g. all that can be found is a tooth which has or has not cut through the gum when expected, the probability is that the fits will recur on very slight provocation.

Permanent mental impairment, resulting from convulsions alone is rare. As a rule the cause of the convulsions is also that of the mental deficiency.

It is usually estimated that 10 per cent. of infants who suffer from convulsions become epileptics in later life. There is some ground for the popular belief that children may "grow out of fits," for it is a fact that epilepsy may become latent. In 34 out of 237 cases, there were intervals of from 2 to 30 years between seizures.

Treatment.—As the most common cause is improper feeding, a grain of calomel or a teaspoonful of castor-oil should be given. The lower bowel should be irrigated with salt solution, or at any rate an ordinary enema given with soap and water. Hot baths, so frequently advised, are of little use, but may be soothing and relieve colic when present. Ice should be applied to the head if the temperature is raised above the normal. Rectal injections of chloral with double the amount of bromide in 2 oz. of water, for an infant of six months, are sometimes advised by the doctor; but such drugs are, of course, only given under medical advice.

Children who suffer from fits only in consequence of emotional excitement or physical fatigue should be treated by careful attention to their mode of up-bringing, education and environment. Bromides may have to be given for two or three months, but not indefinitely. A bromide medicine is liable to bring the child out in spots. To lessen the chance of this a few drops of an arsenical solution are often added to the bromide mixture. Luminal is even more useful in controlling a convulsion which is not due to obvious over-feeding, etc. It can be given by itself as a powder, or in solution as the sodium salt. It does not produce any skin rash or spots, and does not tend to dull the mentality to the same extent that the bromides do. This drug must never be discontinued suddenly after prolonged administration, as there is the possibility of a series of successive fits intervening. (*See also* SUPPLEMENT ON FIRST AID.)

INFANTILE DIARRHŒA.—This is a serious type of diarrhœa which affects young infants and which may leave them very pinched and ill. It is a curious fact that this condition almost always breaks out in epidemic form when the earth temperature reaches 56°F. Flies play a very important part in carrying the germs of the disease,

and particular care should be taken to see that the milk of hand-fed babies is stored in a cool and safe place. The condition is discussed fully under the heading DIARRHŒA.

INFANTILE PARALYSIS (Acute Anterior Poliomyelitis).—This is an acute infection of the spinal cord by a germ which causes destruction, or partial destruction, of parts of the spinal cord which helps to control the power of movement, thus causing loss of movement in a limb or limbs or other part of the body, according to which part of the spinal cord has been damaged. The disease most commonly attacks children between 1 and 3 years of age and occurs usually in August and September. It is spread by "carriers," that is to say, people who have the germ in their noses and although perfectly healthy themselves, are able to infect other people. It may occur in epidemics or in isolated cases, and it is interesting to note that when it occurs in epidemics the disease takes a much milder form and 50 per cent. of the cases make a complete recovery.

The child should be isolated for 14 days after exposure to infection.

Symptoms.—The illness always comes on suddenly, after an incubation period of 4–7 days, with a slight feverish attack and vomiting and perhaps stiffness of the neck. A few hours, or perhaps a few days later it is discovered that the child is unable to move one of its limbs. As a rule the onset is so slight that the mother does not think it necessary to send for the doctor until a few days later when she suddenly realizes that the child cannot move an arm or a leg. There may or may not be pain on trying to move the limb.

Infantile paralysis is sometimes confused with acute rheumatism, but an examination of the fluid from the spinal column during the acute stages will practically always reveal to the expert the presence of the germ.

Whether the patient will recover or not depends upon what part of the spinal cord has been damaged and to what extent. During an epidemic about one in every ten cases dies, and of the remaining nine children four are left crippled, of which some have weakness of both legs and arms, some are mentally defective, while others have a squint or perhaps permanent blindness. In those cases where the onset is most sudden the recovery is usually more complete than those cases where it is not noticed for some time that the child has partly lost the power of movement.

The greatest amount of improvement in the limb occurs within the first six months, after which it becomes very slow or ceases altogether.

It is very difficult at the beginning of the illness to give any idea as to whether the affected limb will go on growing or remain permanently shortened.

Treatment.—During the acute stage the child is kept in bed, lying still, as any movement of the child or the limb may make the condition much worse.

The affected limb should be supported comfortably, in order to prevent deformity such as wrist-drop or foot-drop occurring, and as soon as the pain has eased off it should be put in splints and a cradle should be rigged up over the limb to take the weight of the bed-clothes. A curved fire-guard or a three-legged stool may be used for this purpose.

Injections of serum may be given, but they are of doubtful value. Hexamine in small doses is useful as a disinfectant for the spinal fluid.

The nursing in these cases is of the utmost importance. The bowels should be kept freely open with mild aperients such as milk of magnesia or syrup of figs and the child should be kept on milk diet with a large amount of fluid such as water, lemonade, and barley water. When the acute stage has subsided and there is no more pain, usually three or four weeks from the beginning of the illness, the limb should be gently massaged to keep up the tone of the muscles, thus increasing the chance of recovery of the power of movement.

Electrical treatment is very helpful at this stage and the child should be encouraged to try to move the limb itself. Later on light non-inflammable celluloid splints can be applied to the limb to keep it in good position, but these must be frequently removed so that the massage and electrical treatment can be continued. Operative treatment may be necessary in the later stages from time to time to divide the contracted tissues and correct deformity in the

limb. At all times during the illness the limb should be kept extra warmly covered.

INFANTILISM.—This is an abnormality of development which results in a failure to grow up. The individual bears into adult life many of the physical and mental characteristics of a child. In the category of infantilism, mental defectives are generally excluded, and the term is limited to certain fairly clear-cut types with definite causes. One of the commonest varieties is that which results from defect in the working of the thyroid gland situated in the neck. In extreme cases of thyroid deficiency, the child is stunted in mind and body and is called a "cretin." Lesser degrees of deficiency occur, the child showing various infantile characteristics of mind and body, and such persons have been aptly described as "pocket editions of humanity." If an extract of thyroid is given to such children as soon as the defect is discovered, a remarkable improvement takes place.

Intestinal or pancreatic infantilism arises from a deficiency of the pancreatic gland, with the result that nutrition is seriously interfered with and growth is impeded. It is often accompanied by diarrhœa. If appropriate dietetic measures are adopted, this type is curable. Disorder of the pituitary gland, situated at the base of the brain, may produce infantilism and this type is often associated with marked obesity. Chronic kidney disease in early childhood leads to infantilism, but as a rule the children are so delicate that they succumb early in life. (*See also* BRAIN; CRETIN; DWARF.)

INFARCTION.—If a part of an organ in the body is deprived of its blood supply *infarction* may occur. Each organ is supplied with blood by an artery which in the tissue subdivides or branches into numerous small vessels each controlling the nutrition of a cone-shaped piece of the organ. Should one of these branches be blocked by a small clot of blood, or a fragment of a growth on a heart valve (embolus), the conical part is deprived of blood and is called an *infarct*. This portion of tissue may die and, as it is bloodless, it is known as a *white* infarct. This is often seen in the spleen and kidney. It may happen, as in the case of the lung, that blood from neighbouring veins passes into the empty vessels and engorges them. In such instances, the term *red infarct* is applied, and if the blood is squeezed into the surrounding tissues, it is called hæmorrhagic. Should this occur in the lung, the expectoration (spit) will be bloodstained. In some cases the clot which blocks the artery may be septic, i.e. infected with germs, and then the resulting infarct will form an abscess in the organ. Infarcts are ultimately replaced by fibrous or scar tissue.

INFECTIOUS DISEASES.—Diseases which are capable of being transferred from one person to another are termed *infectious*. If actual contact with a diseased person is required to convey it to another, the disease may be called *contagious*. Some diseases such an anthrax, glanders and tuberculosis may be conveyed to man from infected lower animals. The infectious diseases are very numerous and include those which are popularly termed "the fevers."

How Disease Germs are Spread.—Micro-organisms or germs (bacteria) are the cause of the infectious diseases and their spread takes place in a variety of ways. The germs may be *air-borne*, which means that infection takes place through contact with the expirations, coughs, and sneezes of an infected person. This is one of the commonest methods of infection and it is in this way that measles, scarlet fever, diphtheria and the "common cold" are spread. Germs may also be *water-borne*, through contamination of a water supply. Typhoid and dysentery are often spread in this way.

Food may also distribute germs, particularly milk, which may give rise to epidemics of scarlet fever, diphtheria and infantile diarrhœa, and is a common source of tubercular infection. Clothes, or articles used by a sufferer from an infectious disease (called fomites), may act as distributors of infection, smallpox being an example of a disease liable to be spread in this way. Another method of spread is by "carriers," i.e. persons who harbour the germs but do not themselves suffer from the disease. Typhoid, diphtheria, and cerebro-spinal fever are often spread through the agency of carriers. Finally, infection may be conveyed from one person to another by the agency of insects and other parasites. Typhus, relapsing, and trench fever are conveyed by the bite of an infected louse; malaria, and yellow fever by the bite of an infected mosquito; and sleeping sickness by the bite of an infected tsetse fly.

Stages of an Infectious Fever.—After the invasion of the germs, a varying period of time elapses before any symptom becomes manifest. During this time germs are developing and multiplying. This is called the "incubation" period and it varies for different fevers. Then comes the "invasion" or onset of the first symptoms, which is followed by the stage of eruption shown by the appearance of the rash while the feverish symptoms are marked. Running a definite course, the fever diminishes, the stage of "resolution," and eventually comes the stage of convalescence during which recovery should become complete. At any time, however, "complications" may arise and delay the favourable course of the disease.

Nursing of a Fever Case.—The nursing of a case of infectious fever is of great importance. The patient should be cared for in an open airy room, preferably at the top of the house and stripped of curtains, pictures and carpets.

Complete Isolation (except in the case of the nurse) is required until all danger of spreading the infection is passed. The bed should be freely accessible and a hair mattress is best. Feeding and other utensils should be kept quite separate and apart. Books should not be allowed to leave the sick room. Antiseptic precautions must be adopted if any of the body discharges are infectious—as in typhoid for example. Motions and urine may be sterilized with lysol or chloride of lime; bed-linen can be similarly treated. The nurse should keep a careful note of the quantity of food given and should record on a chart, temperature, pulse and respiration rate. When the period of infectivity is over, the room and all its contents must be thoroughly disinfected. This is generally undertaken by the local public health authorities. It is to be noted that all who have been in contact with an infectious case should be isolated until the quarantine period (dependent upon the incubation period) has elapsed.

Certain infectious diseases must be "notified" to the Medical Officer of Health for the district. This is usually undertaken by the doctor attending the case. The chief notifiable diseases include: scarlet fever, diphtheria, smallpox, erysipelas, typhoid, dysentery, typhus, acute lobar pneumonia, tuberculosis, cerebro-spinal fever and encephalitis lethargica. From time to time diseases such as mumps, measles and chicken-pox may be made notifiable in a particular locality.

The duration of the incubation and quarantine periods for the different infectious diseases are given under the heading INCUBATION. (*See also* SERUMS.)

INFILTRATION.—The spaces between the cells and fibres of the body tissues are normally filled with a nourishing fluid called the lymph. This fluid is derived from the bloodstream. Infiltration means that there is an excess of fluid in the tissues. This occurs in inflammation and in dropsy, the latter condition being due to a sluggish circulation from heart failure or from blood changes in kidney disease. The term is also used to describe the increased development of fat between the muscle fibres of the heart, and the insinuating of cancer cells amongst normal cells of any tissue. (*See also* DROPSY.)

INFLAMMATION.—The reaction of animal tissues to any irritant is described as inflammation. There are four characteristic signs, viz. redness, heat, swelling and pain. Inflammation is of the nature of a defensive mechanism against injury from any cause, germ infection, chemical irritants and heat as in a burn. There is first of all a dilatation of the vessels in the area affected and flushing of the part with blood, thus explaining the heat and redness. There is also a discharge of watery fluid or lymph into the tissue spaces, distending them and causing the swelling and pain. This distension allows the drive of the heart-beat to be felt, so causing a throbbing pain.

There is a slowing down of the circulation in an inflamed area, and the white cells of the blood accumulate in large numbers and many make their way between the tissue cells. The migration of these cells and of the watery fluid is definitely for a salutary purpose. The lymph contains substances which are harmful to germ life, while the white cells wage warfare on the germs eating them up when possible. Sometimes, however, the fight between the germs and the white cells results in the latter being killed and in this way *pus* cells are formed and if this takes place on a large scale an *abscess* results. A boil, for example, is a tiny skin abscess, the core of which consists of white cells killed by the invading germs.

Inflammation, therefore, is a defensive

activity of the body and it may be strong enough to cure the condition. On the other hand, this line of defence may fail, and the germs gaining a temporary victory make their way along lymphatic vessels, inflaming them and ultimately reaching the lymph glands. It is well known for example how a poisoned and inflamed finger gives rise to pain in elbow and armpit.

Treatment.—In the treatment of inflammation three points must be observed: (1) removal of the cause; (2) rest for the inflamed part; (3) removal of the products of inflammation. Rest will lessen pain and reduce the work of the part, so permitting it to concentrate against the enemy. Occasionally it may be possible to get rid of the offending agent at once, as when a foreign particle gets into the eye, or by washing and cleaning a dirty wound. It is possible to assist Nature by applying hot dressings (fomentations) which increase the blood supply to the part and so increase the available amount of lymph and white blood-cells. Also, hot applications tend to relieve the pain. If pus should form, it should be permitted to escape. This may necessitate incision with a knife. Chronic inflammation may follow on an acute form, or the intensity of the initial inflammation may be very slight and the resistance of the tissues low so that the inflammation process is long drawn out.

In these circumstances, there are some repair processes taking place alongside the destructive ones. There is a growth of new fibrous tissue-cells producing hardness, but little redness, heat or pain. This type of inflammation is often seen in the case of a chronic leg ulcer resulting from the pressure of a varicose vein. Chronic inflammation is difficult to treat, but every effort must be made to stimulate the resistance of the body generally by good food, tonics, and fresh air, sunlight and exercise. Attention to the bowels is also important. (*See also* ABSCESS; BOIL.)

INFLUENZA.—This is an infectious disease, occurring in epidemic form, and from time to time ravaging the whole world. The last great epidemic was in 1918, and prior to that date, in 1889–90. It may occur at almost any time of the year, but is generally most prevalent in the colder months. It is caused by a germ or microbe, but the specific nature of this germ is still undecided. Recent research points to a filterable virus, i.e. a germ so minute that it cannot be seen by a microscope, but is able to pass through a fine porcelain filter. Infection takes place when a sufferer coughs, sneezes or speaks loudly, emitting droplets of expectoration which are laden with germs. It is possible that handkerchiefs and clothes harbour the germs and act as distributing agents.

The symptoms of this disease are many and varied, and may show themselves in all the systems of the body. After invasion with the germs, there is a short incubation period of from one to four days and the onset is sudden and marked by shivering, rise of temperature, headache, sickness, vague muscular pains and a feeling of exhaustion. The throat may be sore and there is often a dry irritating cough. Three main types of influenza occur: respiratory, gastro-intestinal, and nervous. In the first, bronchitis, pleurisy and pneumonia may arise; in the second, there is catarrh or inflammation of the stomach and intestine, with sickness and diarrhœa, pain in the belly and sometimes jaundice; in the third and nervous type, headache is very severe; there may be an excessively high temperature and occasionally meningitis may arise. Influenza thus shows considerable variation in type and in different epidemics, one or other of the types tends to predominate.

As a rule, the course of the disease is short, lasting from three to five days, but complications are very apt to arise and delay convalescence. Bronchitis may persist for some weeks and not infrequently develops into broncho-pneumonia (a patchy inflammation of the lungs). In all forms of the disease, heart symptoms are common and constitute one of the major dangers of influenza. The heart muscle may be weakened, revealed by irregularity and rapidity of the pulse, or inflammation of the heart valves (endocarditis) may develop with subsequent valvular disease. Inflammation of the middle ear is not uncommon as a sequel to influenza and occasionally the infection may spread to the brain and spinal cord. One of the most troublesome symptoms of the aftermath of influenza is mental depression which may even amount to an attack of melancholia. Even in mild cases of influenza

a degree of prostration occurs which seems to be out of proportion to the severity of the symptoms and may leave behind an enfeeblement of the general health which may take some months or even years to overcome.

Treatment and Prevention.—The patient should be isolated and precautions taken to avoid spread of infection. Even the mildest cases should be treated in bed, as this lessens the chances of complications arising. The room should be very airy—as fresh air is the best preventive against spreading influenza throughout a household. The diet should be light: milk, beaten-up eggs, beef tea and fruit juices. If the throat is sore, an inhalation of Friar's balsam will be of benefit, and if there is tightness of the chest a linseed poultice will relieve the discomfort. Aspirin is the drug generally used in the treatment of influenza. It is given in ten-grain doses, every four hours, during the acute stage of the illness. During convalescence, a tonic such as Easton's syrup is helpful in restoring appetite and energy, and if possible a change of air to the hills or seaside is very desirable. To avoid influenza during an epidemic endeavour to live as much as possible in the open air. Keep away from warm crowded rooms, theatres, etc. The diet should be generous, containing plenty of raw fruit, green vegetables and dairy produce. Every effort must be made to prevent any tendency to constipation. It may lessen the risk if the throat is sprayed or gargled every morning with a weak solution of Condy's fluid. Mixed vaccines to stimulate immunity against influenza are now available and in many cases have proved of value.

INFUSION.—Watery solutions of vegetable principles prepared by pouring hot water over the actual plants and allowing them to remain in contact with the water for about half an hour are termed infusions. In some cases—quassia and calumba—cold distilled water is used. Most infusions have a dosage from ½ to 1 fluid ounce, but that of digitalis is from 2 to 4 drachms. (*See also* TISANES.)

INGROWING TOE-NAIL.—This is a condition in which the outer edge of the big toe-nail presses into the flesh and causes a very tender spot to appear. Badly-fitting shoes are very often the cause of this painful condition, but probably the chief cause is cutting the nail in the wrong fashion. The nail of the big toe should be flat and should never be cut too short. The outer edges should never be trimmed down at the sides as this induces the nail to curve instead of remaining perfectly flat; in fact, it is better to cut the nail lower at the centre. Trimming the nail in this way will help to avoid the condition. *See* article on the care of the feet in BEAUTY CULTURE SUPPLEMENT at the end of the book.

INHALATION.—Inhalation is a method of treatment in which drugs can be taken into the body by the breath. In this way general anæsthesia is usually carried out by means of a special inhaling apparatus. Steam inhalation is perhaps the most popular form of this type of treatment. It is used especially in cases of bronchitis and in inflammatory conditions of the nose and throat. A very simple way of carrying out this treatment is to fill a jug with boiling water into which has been placed a teaspoonful of Friar's balsam or any other soothing volatile oil. The head is covered with a towel and held over the jug so that the fumes from the jug are not allowed to escape. The patient should breathe through the mouth as well as the nose in order to allow the soothing fumes to reach the mucous membranes of these parts. Instead of steam, liquid substances may be sprayed into the throat or nose by an atomizer, and by taking a deep breath this fine spray can be carried on into the back of the throat and the lungs. This method is particularly useful when there is a quantity of thick mucus or phlegm which the patient has difficulty in coughing up. The use of a steam-kettle is also very beneficial in cases of chronic bronchitis or croup.

People who suffer from asthma often obtain relief by inhaling the smoke given off from specially medicated cigarettes. Another remedy is to soak blotting-paper in a solution of nitre; this should be dried, then placed in a suitable jar and lighted. The fumes given off will be found very beneficial during an attack.

Many hospitals and spas now have special rooms fitted up for treatment by inhalation. These rooms are called inhalatoriums. Some of them are fitted up with special sprays, while in others, the whole room is filled with

medicated vapour which a patient can sit and inhale for hours.

Inhalation may be carried out by means of sprinkling certain drugs on a handkerchief and breathing into this. A few drops of eucalyptus is often used during a cold in the head, and amyl nitrite is also taken in this way to relieve an attack of angina pectoris. (*See also* ASTHMA; ATOMIZER; BRONCHITIS.)

INHIBITION.—The act of checking or restraining an action or impulse is known as an inhibition. The workings of the body may be inhibited as well as the workings of the mind; for example, the heart may stop beating for a fraction of a second if cold water were dashed over the skin. The mental aspect of inhibition is discussed in the article on FREUDISM.

INJECTION.—Medicinal remedies in solution are sometimes administered by forcing them into the tissues of the body from a syringe fitted with a hollow needle. In most cases the purpose of the injection is for speed in obtaining its effects and for accuracy of dosage. Again, this method has obvious advantages in the case of patients who are unconscious and collapsed and cannot swallow. Also, some drugs are acted upon by the digestive juices and rendered ineffective so that injection is the only method of administration.

An injection may be intradermal, i.e. into the skin, this method being used for producing local anæsthesia or insensitiveness to pain. The most usual way for administration of drugs is hypodermically, i.e. under the skin. Some drugs are liable to irritate the skin (mercury and quinine), and these are given intramuscularly, i.e. deeply into a muscle usually of the thigh. Intravenous injection, directly into the blood-stream, can be accomplished through a vein, usually one of the surface veins of the arm at the elbow. This is the most rapid way of obtaining the action of a drug. Injections may be made into the spinal canal in order to secure insensitiveness to pain for operation purposes. An injection into the bowel is called an enema, while injections into the nose or vagina are termed douches. (*See also* DOUCHE; ENEMA.)

INNERVATION.—This word means "provided with nerves." Every part of the body is innervated and so brought under the control of the brain and spinal cord. The innervation of the skin, for example, furnishes it with the sense of heat and cold, pain and touch. (*See also* NERVOUS SYSTEM.)

INNOMINATE.—This word means unnamed, and it is strange that it should be applied to a number of important structures, the innominate bone, the innominate artery and innominate veins.

The innominate *bone* or haunch-bone is large and irregular in shape and really consists of three bones: the ilium above, the ischium behind and the pubes in front. In early life the three bones are separate, but by the time adult life is reached the joining cartilage or gristle is replaced by bone and the parts are inseparable. Each takes part in forming the acetabulum, the cup-shaped depression into which the femur or thigh-bone articulates. The innominate bone has important connections and relations. At the back it is united by powerful ligaments to the sides of the sacrum—the bone at the lower end of the spinal column—and in front it is firmly attached to its fellows of the other side, the bones thus forming a bony basin called the pelvis. In this way is constituted the pelvic girdle for the support of the lower part of the trunk and for the attachment of the lower limbs.

The innominate *artery* is one of the largest in the body. It comes directly from the main arterial stem (the aorta) on the right side and it breaks up into two branches, the right common carotid and the right subclavian arteries which supply with blood the right side of the head and the right upper limb respectively. The innominate artery lies close behind the highest part of the breast-bone, behind, it is closely related to the wind-pipe and the right lung comes in contact with it. Any penetrating wound of this artery is almost inevitably fatal owing to the high pressure of blood within it.

The innominate *veins* are two in number, the right and the left, each receiving the blood from its own side of the head and neck, and the corresponding upper limb. They are short wide vessels which soon unite to form the superior vena cava which carries the blood to the right auricle of the heart.

INOCULATION.—This is the operation by which disease germs, dead or greatly reduced in virulence, are introduced into the body through injection under the skin. The

purpose of this is to increase the resistance of the body to the germs inoculated and so preventing disease. The system of inoculation was founded on Jenner's experiments with cowpox which is simply smallpox in the cow. He used material from an infected cow to induce a mild form of this disease in order to prevent the more severe ordinary smallpox. A considerable number of diseases are prevented and treated by this method of inoculation. The most important of these are typhoid, para-typhoid, rabies, dysentery, tuberculosis, and common septic infections such as boils, acne and catarrh of the nose. (*See also* ANTIBODY; ANTITOXIN; SERUMS.)

INQUEST.—If there is any reason to suspect that a person has died a violent or unnatural death, the circumstances must be investigated and the matter made the subject of a formal inquiry. The inquest, as it is called, is conducted by the coroner, with or without a jury, this being left to his discretion. The same procedure is adopted if a person dies in prison. The coroner issues summonses to the witnesses to attend and failure to do so occasions a fine not exceeding £5. The jury and coroner must "view" the body. Persons interested may attend and be represented by their solicitors. The coroner is not bound by the laws of evidence which prevail in an ordinary court of law. It is the duty of the coroner to sum up the case and for the jury to deliver the verdict. The jury are entitled to add a "rider," if any matter has become apparent which deserves public comment. A coroner may commit a person for trial at the criminal court for murder or manslaughter.

INSANITY.—Strictly speaking, this is a legal term denoting the civil state in which an individual is unable to look after himself or others, and is a menace to society. It signifies that liberty must be restricted and a certain degree of legalized control must be exercised. In such a state of mind a person requires to be "certified," and this implies detention for the purposes of care and treatment in a mental hospital. Insanity is dependent upon disease of the mind, and it must be distinguished from mental defect or feeble-mindedness which means that the mind has not developed but has remained fixed at a childish level.

There are a great many types of insanity and a great many causes. In about 40 to 50 per cent. of cases, an unstable mind is inherited, but in a very considerable proportion of cases external factors, such as alcohol, syphilis, childbirth, physical exhaustion, hardened arteries, severe fevers, brain tumours and injury, diabetes and prolonged mental stress are the direct causes of the mental symptoms. Some forms of insanity are associated with great depression and impulses to suicide, others with excitement and violence. In one type, there is tendency to a gradual breaking up of the mind (schizophrenia or dementia præcox), while in another, delusions of persecution are the chief symptom. Confusional mental disorders, or insanity, are generally due to some variety of brain poisoning.

The procedure in regard to certification depends upon the means of the insane person. If the patient or relative can afford to pay nursing-home fees, he may be admitted to a "licensed house" or registered hospital as a "private patient." Fees vary from a minimum of three guineas upwards. Certain statutory documents have to be filled in. These consist of (1) a petition of a near relative to the judicial authority (stipendiary magistrate, justice of peace, or judge); (2) a statement of particulars signed by petitioner; (3) two medical certificates and (4) the order of the judicial authority ordering the reception of the patient into an institution. These documents together constitute the *Reception Order on Petition*, and the reception of the patient must take place within seven days of the signing of the order.

If it is necessary to place a patient under control immediately, an Urgency Order may be used. This consists of a reception order signed by the nearest relative, a statement of particulars, and a medical certificate giving the grounds for the urgency. This permits of detention for seven days. A patient can be certified and kept under care in his private home, or in the house of a doctor or lay person, provided that the patient can be suitably nursed and that the Board of Control is duly notified.

Entrance to a public mental hospital, as a rate-aided patient, is generally arranged by the relieving officer of the parish. He arranges the removal to the observation ward of the Public Assistance Hospital, where, after a period not exceeding fourteen days, he may be sent to the mental hospital under

one medical certificate and an order by a justice. Under the Mental Treatment Act of 1930, patients may be admitted to a public mental hospital as *voluntary patients*, i.e. without certification, by the request of the patients themselves; or as *temporary patients* for six months, where recovery is likely to take place within that time.

Contrary to popular opinion, a great deal can be done for the insane by scientific methods of treatment. The modern mental hospital is very different from the asylums of last century. It is no longer merely a place of detention: its organization promotes the alleviation and, in many cases, the cure of the mentally sick.

A patient, though certified of unsound mind, is not debarred from making a valid will provided the patient possesses a "sound disposing mind," which simply means that the insane person has an understanding of the nature of the will, the extent and details of his estate, and the individuals who have reasonable claim to benefit from it. It is generally advisable to have the testimony of a medical witness to the patient's testamentary capacity, otherwise it is not likely to be upheld by law, if contested. (*See also* MENTAL DEFICIENCY; MENTAL DISEASE.)

INSECT BITES.—This subject is dealt with fully under the heading BITES AND STINGS.

INSECTICIDE.—A drug which is capable of killing insects is known as an insecticide. Mercury may be used as an ointment or as a lotion in order to get rid of the small insects which are parasitic on human beings. Sulphur may be used as an ointment, a lotion, or as a means of fumigation. Formaldehyde is also an insecticide and may be used in various ways. Many other antiseptic drugs can be used for the same purpose. (*See also* BITES.)

INSECTS.—Insects play a large part in the carrying of disease, perhaps more so in tropical countries than in climates such as we have in England, and of recent years much public health work has been done towards the prevention of the spread of disease by these pests. (*See also* BED BUG; FLEAS; FLIES; MOSQUITO.)

INSOMNIA.—Sleeplessness or insomnia is a symptom of disturbed working of the mind or body. It is, in itself, very dangerous to health, particularly in the case of growing children who suffer stunting in mind and body as a result. Among the common causes which may initiate sleeplessness are lack of fresh air from bad ventilation of the bedroom, insufficient exercise, heavy meals before retiring, late hours and mental work carried beyond the stage of weariness. With sensitive people, a strange bedroom, unaccustomed sounds or lights, a pillow of unusual height, an uncomfortable mattress or too heavy bed-clothes are liable to make falling asleep difficult. Bodily ill-health, particularly when associated with pain, and notably in heart or chest complaints, frequently hinders sleep, while mental ill-health ranks as a chief cause of insomnia. Worry or apprehension are formidable enemies of sleep, for they tend to reach their highest pitch at bed-time.

Sufferers from persistent insomnia are apt quickly to reach the stage when they despair of ever again enjoying a good night's sleep. This hopeless attitude is very natural, but it must be fought against. The first step is to convince the mind that the disability is remediable. That accomplished, the sufferer should examine his habits of life and try to discover the cause or causes of the insomnia. Provided there is no physical disease requiring medical attention, there are certain measures which, if persevered in, will eventually restore the sleep rhythm.

Sufferers from insomnia should spend the hours before retirement in some unexciting pastime and go to bed at approximately the same time every night, as habit plays a large part in the function of sleep. Late meals are taboo, as also strong coffee or tea, but a glass of warm milk is soothing and promotes drowsiness. The bedroom must be well ventilated without being cold, and the bed comfortable with light but warm bed-clothing. The body should be warm before retiring. Cold feet are a common cause of sleeplessness, therefore a hot-water bottle may be necessary. A warm bath is often valuable as it promotes relaxation of the muscles.

When in bed, it is best not to anticipate a bad night or think deliberately about getting off to sleep. The sufferer should concern himself only in making himself thoroughly comfortable and should try to *stop* thinking. A word of warning. It is most inadvisable for anyone to have recourse to sleep pro-

ducing medicines except under the personal direction of the doctor. Such drugs are dangerous when wrongly used and are seldom necessary if natural means to sleep are fully tried. (*See also* SLEEP.)

INSUFFLATION.—The introduction of powdered drugs into the nose, throat or ear is called insufflation and the apparatus, which simply consists of a rubber ball attached to a vulcanite tube, is termed an insufflator. The powder is injected in a fine cloud and insufflation is a useful means of introducing antiseptics to the inaccessible parts of the nose and throat. Boracic powder can be blown into the ear or nose when it discharges while iodoform can be similarly used in other septic conditions.

INSULIN.—In the pancreas, one of the digestive glands in the abdomen, are groups of cells called the islets of Langerhans which produce an internal secretion (i.e. passed directly into the blood-stream), called insulin. This substance is necessary for the utilization of sugar by the body and its absence or deficiency leads to diabetes mellitus. Insulin was only discovered in 1921 by Dr. Banting of Toronto, and it is now prepared commercially and used extensively in the treatment of diabetes. Since its introduction the mortality caused by diabetes has lessened by one-half. It is generally given by injection under the skin and the doses must be carefully controlled according to the amount of sugar in the blood. Insulin is particularly valuable in the treatment of diabetic coma. (*See also* DIABETES; DUCTLESS GLANDS; PANCREAS.)

INTELLIGENCE, TESTS FOR.— Up to the beginning of the present century, there was no rational attempt at grading persons in terms of their intelligence. Children not quite up to the average were classed all together as "backward"; and persons, whether children or adults, still further below the average as "mentally deficient." There was no attempt at special education, and, as a result, a terrible waste of many lives which nowadays, if not reaching a high standard of intelligence, are yet happy and useful.

Alfred Binet (1857–1911) was the first to recognize this practically, and he devised, in 1905, scales and tests to measure the intelligence, which are now very widely used. They have been modified from time to time by other workers, notably Simon and Stamford, and are now known as the Binet-Simon tests. Many other tests have been devised, all on the same lines.

They are used in order to find out the stage of mental development which a person has reached; they refer not to special learning, but to general intelligence, and are applied to children, or to adults with lesser degrees of mental deficiency. The tests have been standardized by "trying them out" on a large number of normal children, and are arranged in a series of increasing difficulty, each year having its own tests. Then, according as to what capacity a person shows he is classified as being of the *mental age* of 6, 10, 15, etc., regardless of his *physical age*. It is interesting to note that the tests work out very accurately for all normal children, irrespective of race, position, or education. As examples, the tests for children of 5, 8 and 15 years are appended:

(5.) 1. Tells which is the heavier of two boxes similar in size and appearance.
2. Copies a square with pen and ink.
3. Repeats a sentence of 10 syllables.
4. Counts 4 pennies.
5. Puts together an oblong card which has been cut from corner to corner.

(8.) 1. Compares two things from memory such as fly and butterfly, wood and glass, paper and cardboard.
2. Counts backward from 20 to 1.
3. Points out what is missing in 4 sketches, e.g. a face without a nose.
4. Knows the day and date.
5. Repeats 5 numbers after the examiner.

(15.) 1. Repeats 7 numbers.
2. Finds 3 words rhyming to "day" in one minute.
3. Repeats a sentence of 26 syllables after hearing it once.
4. Understands pictures capable of sympathetic interpretation. A description alone is not enough.
5. Completes an incomplete account such as: "My neighbour has had strange visitors to-day; a doctor, a lawyer, and a minister. What is happening at my neighbour's?"

The examiner should see that the child is at his ease, preferably looking upon the tests as a new game. Each child is tested separately. No help is given; it is considered that a child has failed in a particular question

if he does not understand it. Various criticisms are made regarding the tests, especially that they are rather too easy for British and American children. They are not perfect; but in spite of that they are of great practical value. They are very useful in grading children, especially young children on first going to school, and those mentally deficient. Their principal value, however, is to remove from many "backward" children the stigma of mental deficiency. Such a child may even have been reported by his teacher as being deficient, but is found to be of normal intelligence by the tests. The fault sometimes lies with the teacher or the school, and when he is placed in another school, his "backwardness" disappears. (*See also* CHILD GUIDANCE CLINICS.)

For mentally deficient adults, the tests are used in a similar way. (*See also* MENTAL DEFICIENCY.) There have been a great variety of tests devised for normal adults, but so far there are none of any practical importance. Some are very trivial; some far too difficult and complicated, requiring special apparatus, etc.; some are too liable to errors of interpretation by the examiner. After numerous experiments, however, it has finally been decided that "a man succeeds in any act requiring intelligence because he possesses both general ability and specific ability." This the ordinary person already knows, only he would say that "Brown gets on because he has common sense and a gift for his job."

INTERCOSTAL.—This name is applied to the nerves, muscles and vessels which lie between the ribs. The space between each rib is also known as the intercostal space.

INTERMITTENT CLAUDICATION.—This condition, sometimes called intermittent limp, consists of numbness, tingling, pain and cramp in the muscles of the leg. It comes on after walking and leads to a limping gait or it may cause complete inability to walk. The arteries of the affected limb cease to pulsate and the foot and leg may become blue and swollen. As a rule the condition subsides rapidly, but tends to return after further walking. This affection is often associated with hardening and thickening of the arteries (arterio-sclerosis) and is caused by a spasm of the narrowed arteries depriving the muscles of their blood supply. During an attack, rest followed by massage is the best means of obtaining relief. Prevention of further attacks depends upon the successful treatment of the existing hardening of the arteries, or of the block in the circulation which caused the limp. (*See also* ARTERIO-SCLEROSIS; DEGENERATION.)

INTERMITTENT FEVER.—There are many diseases in which periods of fever are present, for example, in cases of malaria, or in the later stages of tuberculosis; on the other hand the fever may be more or less continuous with short periods in which the temperature returns to normal. Such a condition is referred to as intermittent fever.

INTERNAL SECRETIONS.—Recent researches have proved that many of the glands of the body discharge substances directly into the blood-stream without passing through any channel or duct. These substances are very important and they are medically known as internal secretions. They are discussed fully in the article entitled DUCTLESS GLANDS. (*See also* INSULIN.)

INTERTRIGO.—This condition arises through two parts of the body coming in contact with each other and causing redness and chafing on the surface of the skin. The most common parts to be affected are the groins, the thighs, and the armpits. In infants the chafing may be caused by the napkin, and stout women may find that chafing occurs underneath the breasts. In the earlier stages of intertrigo, the condition will soon clear up by the application of a good dusting powder.

Care must be taken to keep the parts clean, and on no account must the skin be scratched. Irritation of the affected parts may turn a case of simple intertrigo into a septic dermatitis which will require special treatment. (*See also* CHAFING; DERMATITIS; ERYTHEMA.)

INTESTINAL STASIS.—This term is applied to the stagnation of the contents of the bowel and is most commonly used in connection with constipation. (*See also* AUTO-INTOXICATION; CONSTIPATION.)

INTESTINE.—The intestine or bowel is that part of the digestive system which extends from the outlet of the stomach to the anus and it is approximately twenty-five feet in length. It is suspended in the cavity of the abdomen, or belly, by folds

of tissue called the mesentery. The intestine is divided into two parts, the small and the large. The former extends from the stomach to the junction with the latter at the cæcum, a pouched portion of the large intestine to which the appendix is attached.

The small intestine consists of three parts, viz., the *duodenum* consisting of the first ten or twelve inches into which open the ducts of the pancreas and the liver; the *jejunum*, extending for eight or nine feet, and continuing as the *ileum* which opens into the large intestine. The small intestine is about one and a half inches in width. It has four coats, an outer serous or smooth glistening coat, a muscular one, a submucous one containing blood-vessels and nerves and the mucous coat which is arranged in folds and which is covered with little projections, called villi, for the absorption of nutriment from the food. There are also some small glands there which produce the intestinal juice, a secretion which helps in the work of digestion. Scattered throughout the small intestine are small collections of special cells—called "Peyer's patches," and these are of interest because they become inflamed and ulcerated in typhoid fever.

The large intestine is about six feet in length and is of unequal calibre being largest at the cæcum and gradually diminishing until it reaches the expanded part just before the anus, called the rectum. The large intestine has four coats similar to the small intestine except that villi and digestive glands are absent. It is divided into cæcum, ascending colon, transverse colon, descending colon, pelvic colon and rectum. The appendix is a worm-like structure about three inches long and a quarter of an inch thick, having a small canal extending through it but closed at the end.

Food is passed along the intestine from the stomach by rhythmic muscular waves called peristalsis. Segmental contraction also takes place so that the contents are broken up at regular intervals. In this way the food masses are thoroughly churned up and subjected to the action of the digestive juices. By the time the food reaches the cæcum all digestion and the greater part of absorption of nutriment has taken place. Only water is absorbed in the large intestine and the food remains are hastened on to the rectum from which they are evacuated. About five hours after taking a meal the contents of the small intestine begin to pass into the large intestine and the food remains reach the rectum in about eighteen hours. (*See also* DIGESTION.)

INTOXICATION.—This term is applied to any form of body poisoning. The poisons may be taken by the mouth, e.g. alcohol, morphia, cocaine or hashish or the poisons may be derived from the body as in the case of intestinal intoxication from constipation, or thyroid intoxication from excessive activity of the thyroid gland. The symptoms naturally vary with the intoxicating agent. The effects may be transient or permanent according to the severity of the condition.

Alcoholic intoxication produces well-known symptoms and if very intense may lead to coma (unconsciousness). The respiratory and heart centres are depressed and this may lead to fatal results in some cases.

Treatment.—Treatment should aim at emptying the stomach either by an emetic (mustard and water) or by the use of the stomach tube. Then, a hot stimulating drink of coffee should be given and the patient kept warm with hot blankets and bottles.

INTUBATION.—This term means the introduction of a tube into the larynx (throat) in order to maintain the air passage. Narrowing of the space between the vocal cords may arise during the course of diphtheria and cause suffocation. To prevent this a small tube to which a thread is attached is passed by means of a special instrument into the larynx and left in position between the vocal cords. It is a difficult operation and the patient requires close medical supervision while the tube is in place. The other means of maintaining an airway in threatened suffocation is by *tracheotomy*, an operation whereby an opening is made by the knife into the wind-pipe.

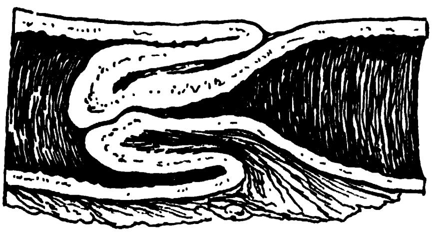
INTUSSUSCEPTION. — This condition consists of the passage of a part of the bowel into the adjoining part: it is as if one part was telescoped into the adjacent part. Most often this takes place at the junction of the small intestine (bowel) with the cæcum. The end of the small intestine normally projects into the beginning of the cæcum, and, in the state of intussusception, this portion travels along the interior of the

large bowel—sometimes for a considerable distance, occasionally as far as the anus.

Intussusception occurs most commonly in young children under twelve months. It arises most probably from the presence of some irritant in the food. This calls forth violent expulsive movements of the bowel and so carries the end of the small intestine into the cæcum. The outstanding symptoms are vomiting, prostration and the passage from the bowel of a little blood-stained jelly-like substance.

Treatment.—An immediate operation is necessary to save the life of the child, but if medical aid is not immediately forthcoming, an enema of warm water will be beneficial.

A chronic form of intussusception occurs in adults, often associated with a bowel tumour. The symptoms are not so urgent



Intussusception

but there is some danger of obstruction of the bowels. Treatment is by surgical operation. (*See also* INTESTINES.)

INUNCTION.—The administration of drugs to the body through the skin is termed inunction. The drug is mixed up with a fatty substance, goose fat allowing of the greatest amount of absorption, and the ointment so formed is rubbed into the skin which has considerable absorptive powers. The outstanding use of inunction is in the treatment of syphilis with mercury ointment. Inunction is also a valuable means of introducing cod-liver oil into the system in the case of children.

INVALID DIET.—Invalid diet and invalid cookery is fully dealt with in the special supplement called DIET and INVALID COOKERY. (*See* end of book.)

IODINE.—This is a substance, taking the form of dark lustrous scales, which is used extensively in medical practice. Generally, the iodine is dissolved in alcohol to form a tincture, which is available in two strengths, the strong and the weak. Weak tincture of iodine is most often used as an antiseptic in cases of wounds of the skin when it is painted on. It is sometimes used to prepare the skin prior to a surgical operation. The strong tincture is used as a counter-irritant, i.e. to produce a surface irritation on some deep-seated inflammatory process. If the skin is at all sensitive it will produce blistering, so that it must be used with caution. It should be remembered that the use of iodine for the treatment of cuts and abrasions does not exclude the need for thorough cleansing of the wound first of all with clean water.

Iodine is sometimes used in ointment form for the treatment of skin affections—and for rubbing over rheumatic joints and muscles. The weak tincture in very small doses, 2 to 5 minims, may be used internally to relieve vomiting and nausea. It is also used in the treatment of rheumatoid arthritis.

Iodine is normally present in the body, being an essential constituent of the secretion of the thyroid gland.

Poisoning.—If the tincture is accidentally swallowed, give an emetic (salt or mustard and water), and then thin starch, arrowroot or bread freely.

Iodized Salt.—At table, salt containing a small amount of potassium iodide, a salt of iodine, is now available, and it is of benefit in a certain type of simple goitre. It is believed that this form of goitre (Derbyshire neck) is related to a deficiency of iodine in the drinking water.

Iodism.—If iodine or iodides are given in excess they may produce symptoms known as iodism. The eyes and nose run freely, the saliva is increased; there is dull headache and sometimes depression. Treatment is obvious: stop the administration of the iodine preparation.

IODOFORM.—This substance, made from alcohol, iodine and carbonate of potassium, is generally available as a lemon-yellow crystalline powder. It has a distinctive odour not unlike strong seaweed and it is nearly insoluble in water but dissolves in ether. It contains 90% of iodine. Iodoform is used as a local antiseptic, for it liberates iodine on contact with the tissues. It is used for dusting septic wounds and sores, ulcers and abscess cavities. Care has to be taken not to apply iodoform to large raw surfaces or poisonous symptoms may arise. It can

be used as a suppository when combined with oil of theobroma and it is often employed as a surgical dressing when it is applied to gauze. A paste made up of bismuth, iodoform and liquid paraffin is used for packing abscess cavities: this is commonly referred to as B.I.P.P.

Poisoning by Iodoform.—The symptoms are variable, but a quick pulse, dilated pupils, headache, vomiting, depression and collapse are generally observed. The use of the drug must be immediately discontinued and any surface to which it has been applied should be washed with a solution of sodium bicarbonate in water.

IONIZATION.—Ionization or ionic medication is an electric treatment from which great things were hoped when it was introduced first. It aims at depositing curative drugs in the tissues by means of an electric current. This method of treatment has proved valuable in many cases, but has not proved the cure-all it was thought it might.

Method of Ionization.—By soaking the electrodes—the part of the electrical apparatus which comes in contact with the patient—in solutions of certain substances such as iodine or salicylate—ions, or electrically charged units of those substances, are introduced by the current into the tissues of the body. Some authorities have claimed remarkably good results for this sort of ionization; but others have serious doubts as to its usefulness on the ground that the quantity of the drug so introduced is very very small and that the ions move so slowly that at the best only the tissues just underneath the skin can be reached.

Uses of Ionization.—The most common uses of ionization are iodine and sodium salicylate for gout and chronic rheumatism, chlorine for scars caused by burns, for adhesions about joints and for neuritis caused by the pressure of a nerve ending of a scar. Solutions of zinc and copper, which are antiseptic substances, are used for ulcers and festering wounds. Zinc ionization has proved very useful in the treatment of chronic ear discharges and is popular in school clinics.

Ionization is administered in the same way as other applications of electricity, notably *galvanism*, and the process is described in the article called Electricity, Medical.

IPECACUANHA.—This is the dried root of a Brazilian plant. It contains two alkaloids, emetine and cephæline. The drug stimulates expectoration, but in large doses is emetic, i.e. causes vomiting. Ipecacuanha has also some action in producing sweating. The drug, in various preparations, is largely used in the treatment of bronchitis and other diseases of the respiratory system. It may be used as ipecacuanha wine, or as compound ipecacuanha powder (Dover's Powder). Ipecacuanha is very useful when the bronchial tubes are filled with secretion. It stimulates coughing and rids the tubes of the accumulated secretion.

Emetine, the alkaloid of ipecacuanha, is used in the treatment of amœbic dysentery. It is usually given hypodermically, i.e. by injection under the skin, but sometimes it is combined with bismuth iodide when it is given by the mouth. A considerable care has to be exercised in treatment with emetine as it has a harmful effect upon the liver and kidneys. Emetine is also used as an emetic in the treatment of poisoning when it becomes necessary to empty the stomach rapidly.

IRIS.—The coloured part of the eye is known as the iris and it surrounds the black centre part of the eye known as the pupil. Its purpose is to regulate the amount of light which enters the eye. (*See also* Eye.)

IRISH MOSS.—Sometimes called Carrageen, Irish Moss is a variety of seaweed and it may be used to make a demulcent or soothing drink. It has also a slightly nutritive value. The most convenient preparation is the decoction of Irish Moss mentioned in the British Pharmacopœa.

IRON.—This metallic element is normally found in the body, chiefly in the red pigment or hæmoglobin of the blood. It is the iron pigment which enables the blood to absorb and carry oxygen to the cells of the body. Iron is primarily obtained by the body from the vegetable kingdom and, as there is a small but constant destruction and excretion of this element, it is essential that the stock should be replenished regularly by eating iron-containing food.

Iron deficiency may lead to a form of anæmia, most often observed in young girls living under unhygienic conditions, which is called chlorosis. In such cases prolonged administration of iron in medicinal form (as well as by eating foods rich in iron)

is necessary, as all the tissues have been disorganized by its lack.

Iron can be given in a great variety of ways medicinally. One of the most popular and useful is in the form of Blaud's Pills, which are not proprietary articles, but the name given to an old formula. These are given in 5–15 grain doses twice or thrice daily after meals. As iron is astringent, it may be necessary to give some aperient at the same time. Iron preparations may not agree with certain people, causing upset of digestion, and occasionally it may be necessary to give the iron by hypodermic injection. Apart from anæmia, states of exhaustion, or convalescence after feverish diseases, or nervous break-downs, will benefit from iron combined with some stimulating drug such as strychnine. If iron is taken in liquid form, it is well to remember that it may damage the teeth. To prevent this, the dose may be sucked up through a straw or glass tube and the mouth well rinsed with water afterwards.

Certain natural mineral waters contain iron notably those from Buxton, Trefriw and Marienbad. They are termed *chalybeate* waters. Sometimes the perchloride solution of iron is used externally, as a styptic, i.e. to arrest blood or bleeding. For example, after a tooth is extracted, a pledget of cotton-wool soaked in the solution and placed in the tooth socket is usually effective in stopping the oozing of blood.

IRRIGATION.—Irrigation of the bowel, more popularly known as the *Plombières douche*, is carried out in the treatment of mild types of dysentery and colitis (inflammation of the colon). A rubber tube is inserted into the rectum and several pints of fluid are slowly allowed to run in. Various types of antiseptics may be given, but as a rule, what is known as a normal saline solution is used for this purpose. *Irrigation of the stomach* is carried out in the treatment of duodenal or gastric ulcers. Irrigation is also a valuable means of cleansing cavities such as the vagina, etc. This is done by means of a douche; but irrigation of the womb, which is a much more serious affair, can only be carried out by a doctor. Irrigation is also a valuable way of removing pus, etc., from a septic wound. (*See also* DOUCHE; ENEMA.)

IRRITABILITY.—To the physiologist, the property of all living cells to respond to a stimulus is termed irritability. It is this property which, for example, enables muscles to contract and glands to secrete. The responses are increased or depressed according to the health and nutrition of the cells concerned. Used in a popular way, irritability is meant to signify an over-excitability. Thus when the heart is unduly sensitive to exertion it is described as an irritable heart, or, when the stomach readily rejects food, it is similarly described as an irritable stomach. This latter condition is most often caused by eating excessive amounts of highly seasoned foods, condiments and alcohol. Irritable bladder is a common complaint and results from inflammation induced by too concentrated urine, stone, or enlarged prostate. Nervous irritability occurs in neurasthenia and anxiety neuroses. In these conditions there is often an underlying exhaustion of the nervous system. Over-fatigue and poisoning from any cause may also lead to nervous irritability.

ISCHÆMIA.—A localized area of bloodlessness or anæmia is referred to as an ischæmia. When there is a general state of bloodlessness, anæmia is the term used. Ischæmia is most often due to a stoppage of the blood flow in an artery by some external pressure, e.g. splints too tightly applied to a limb in a case of fracture. In the arm this accident leads to malnutrition of the muscles which in turn causes them to contract, a condition known as *Volkmann's ischæmic contracture.* The fingers become flexed (bent) and almost impossible to straighten, while the hand is often pulled backwards.

Treatment.—Massage may improve the condition but not infrequently a surgical operation may be necessitated. When splints are applied, the state of the circulation should always be tested. Over-tightness is evidenced by "pins and needles," coldness and blueness of the fingers or toes of the affected limbs. A severe ischæmia may lead to death of the tissue concerned. (*See also* ANÆMIA, LOCAL.)

"ITCH, THE" (Scabies).—The itch, or scabies, is an infectious disease of the skin produced by the Acarus scabiei, an insect just visible to the naked eye. It lives upon the skin, and the female burrows into it to deposit her eggs. At the point of entrance

is a tiny blister, and from this a greyish line or burrow is seen. The parts generally affected are the skin between the fingers, the front of the fore-arms and elbows, the armpits, the nipples, the lower part of the abdomen, the genitals, and the buttocks. The face seldom suffers. In infants, the whole body, including the scalp, may be affected.

In adults, the eruption is very varied, according to the degree of personal cleanliness. In a person who has contracted the disease accidentally, baths daily, and has frequent changes of clothing, a few pimples only will be seen, and the sole complaint will be the itching. On the other hand, in the uncleanly, on whose skin not only the acarus, but other parasites find a happy undisturbed home, the eruption may be very widespread, with boils, dermatitis, etc.

"Norwegian scabies," as it is called, is a severe inflammatory type found among the very poor and dirty, those suffering from wasting diseases, and lepers.

The patient's chief complaint is that of itching, especially at night, and commencing as he undresses. "The removal of the clothes seems to be to the acari an intimation that the time for their nightly prowl has arrived." Scabies is usually contracted by sleeping in an infected bed; sometimes in shaking hands. It is often possible to "trace the acarus to its lair" with a needle passed along the burrow.

Treatment.—Sulphur is the great stand-by in treatment. A usual method of treatment is for the patient to have a hot bath, in which he soaks for 30 minutes, meanwhile scrubbing himself vigorously with a nail-brush and soap. Then he should dry himself and anoint the whole of his body from the neck downwards with sulphur ointment. For effectual treatment, an adult needs 1 lb. of ointment; it is a very common mistake to find too little being used. He should finish by "washing" the hands well with the ointment. He then puts on old clean night-clothes, gloves, and socks, and goes to bed in an uninfected bedroom. This procedure is repeated 5 times at intervals of 12 hours; in the meantime the patient's clothes, bedding, etc., are thoroughly disinfected. At the end of this time the patient will be cured.

A little itching may remain for a day or two as the result of sulphur irritation, and a patient not infrequently goes contrary to his doctor's advice, and continues to use the ointment, thinking that the disease is not cured. He then gets sulphur dermatitis, and his last state is worse than his first. Sulphur should never be over-used.

In the cleanly, a hot bath every night, and the use of sulphur soap will generally cure in 3 or 4 days.

In severe cases, and especially in children, sulphur must be used with caution, or B-naphthal ointment substituted. Stavesacre, styrax, and Balsam of Peru, are also employed in special cases.

ITCHING.—For itching symptoms due to general causes *see* PRURITUS, *also* PRURIGO.

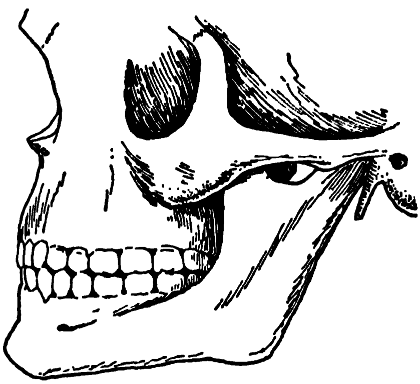
JABORANDI.—Preparations made from jaborandi leaves obtained from a South American plant are given to increase the flow of urine, sweat, saliva and other secretions of the body. This action is produced by an alkaloid substance known as *pilocarpine* which is one of the most powerful sweat producing drugs we have. It also causes the hair to grow more actively, but it makes it grow coarse and dark. Preparations of pilocarpine are employed for many conditions, but they are particularly beneficial in the treatment of Bright's disease (disease of the kidney). Occasionally this drug is used in the treatment of eye disorders, as it produces great contraction of the pupil and also causes decreased tension of the eyeball.

JACKET.—The term strait-jacket is used in connection with insane people who have become so violent that they have to have their actions controlled. The jacket is worn like a waistcoat and it is made of very strong material, usually leather. The sleeves are made to come well below the hands so that the extra length of material can be crossed in front of the body and tied behind the back; in this way the violent motions of the arms are under complete control. The term jacket is also used in connection with spinal supports, or a pneumonia jacket may be meant. This is worn to protect the chest.

JACKSONIAN EPILEPSY.—Described by John Hughlings Jackson, an English physician who was born in 1834 and died in 1911, this is a form of epilepsy in which the spasm is limited to a single group of muscles in the face, arm, or leg, but may also involve other groups of muscles. (*See also* EPILEPSY.)

JAIL FEVER.—The outbreaks of typhus fever were at one time so common in jails that it became known as jail fever. (*See also* TYPHUS.)

JALAP.—Jalap is a very powerful purgative and it is obtained from the roots of a Mexican plant. It is used a great deal in cases where dropsy is present in the body as



Upper and Lower Jaws

it is particularly good for drawing off large quantities of fluid. It is very effective in severe cases of constipation, but large doses should never be given to those suffering from intestinal trouble.

JASMINE.—The dried root of the yellow jasmine which comes from the United States provides us with a drug known as gelsemium. (*See also* GELSEMIUM.)

JAUNDICE.—Jaundice is due to the presence of bile in the blood which causes the skin to turn yellowish in colour. There are many different causes of this condition, and naturally the symptoms vary in accordance with the cause. The commonest form is that known as *catarrhal jaundice*, due to an inflammation or catarrh of the bile-duct which prevents the flow of bile from the liver and gall-bladder into the intestine. This inflammation, it has been found, usually begins in the duodenum, or first part of the small intestine, then spreads to the bile-duct where it causes an obstruction. Jaundice may also occur in almost any general fever, or it may result from obstruction caused by the passage down the bile-duct of gall-stones.

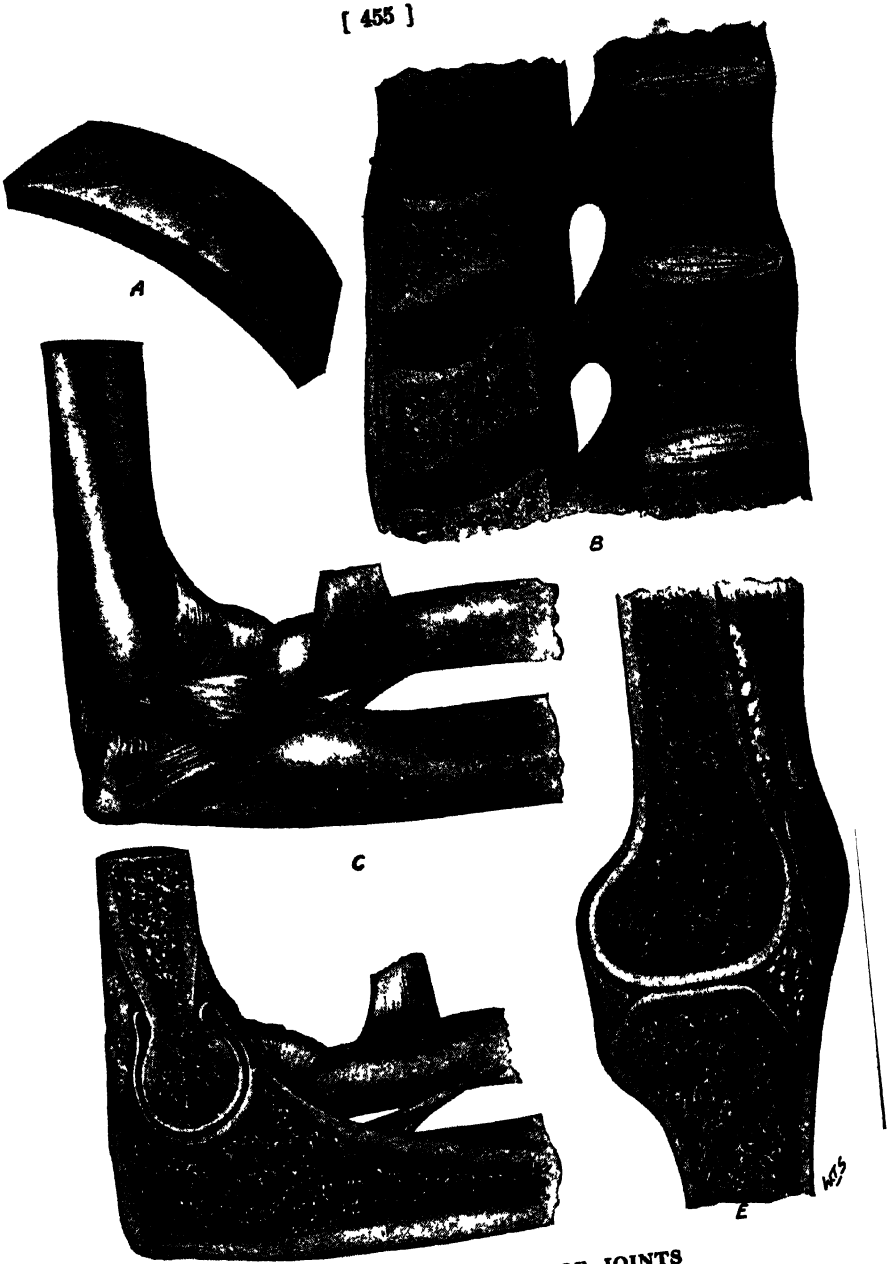
Symptoms.—Catarrhal jaundice may result from exposure to chill, or possibly as a result of overwork and strain. There may be a feeling of nausea and depression for a few days and the skin may feel irritable and itchy. The whites of the eyes are yellow, and the skin also is bright yellow. The tongue is furred and the temperature may be raised to 99° or 100° F. The part of the body over the liver and gall-bladder may feel very tender to the touch. The urine is dark in colour, and the motions are rather offensive, large, and pale, or putty-coloured. The jaundice generally takes about two or three weeks to disappear and as a rule the skin gradually regains its normal colour.

Treatment.—The patient should be kept in bed until the colouring matter has disappeared from the urine. The bowels should be kept open with salts and, if necessary, an enema should be given. The diet should have very little fat in it, in fact, it would be better to exclude fat altogether. Liquid, or semi-solid, food should be given such as barley-water, meat extracts, toast and rusks, and about half-a-pint of milk daily. If the skin is very irritable it should be bathed with a weak solution of carbolic acid or bicarbonate of soda.

Obstructive Jaundice.—Obstructions which may bring on symptoms of jaundice include gall-stones, a tumour or cancer arising in the gall-bladder, the presence of round worms, or a hydatid cyst. Obstruction may also be caused by pressure on the bile-duct owing to enlarged glands or a growth in any of the surrounding organs.

Infantile Jaundice.—Jaundice is very often seen in new-born infants, appearing during the first two days of life. Mild cases may be regarded as a practically normal occurrence, and it clears up after a week or two without any treatment whatever. More severe types may be due to absence of the bile-duct, or some other form of obstruction and the outlook may be very serious indeed. (*See also* GALL-BLADDER, DISEASES OF.)

JAW.—The jaws or jawbones are two sturdy bones of the face into which the teeth are fitted. Of the two jaws the lower is by far the stronger—and it is a much harder task to extract the teeth from it. The lower jawbone is angular in shape and fits into the



DIFFERENT TYPES OF JOINTS

A—Immovable Joint (between bones of Skull)
B—Intervertebral Joints (between the Vertebræ of the Spine) showing, on the right, the intervertebral discs of cartilage between the bodies of the Vertebræ
C—Elbow-joint (hinge joint) showing ligaments holding bones in place
D—Section of Elbow-joint, showing joint cavity and synovial membrane lining
E—Section of Knee-joint, showing patella, or knee-cap, on the right

temporal bone at a point in front of the ear, forming a hinge joint. The upper jaw is altogether a slighter one, and is composed of two bones which are firmly attached to the other bones of the upper part of the face. The teeth fit firmly into sockets in the two jaws which are called *alveoli*.

Dislocations of the jaw are of fairly frequent occurrence but can be easily replaced. Between the ends of the two jaws are little pads of cartilage each of which is called a meniscus. These serve as shock absorbers and to relieve the wear and tear of friction between the two jaws. These menisci sometimes get jerked out of place, causing great pain until they are replaced.

JEJUNUM.—This is the name given to the middle portion of the small intestine. The word comes to us from the Latin, meaning empty of food, and it is applied to this part of the intestine because it is generally found to be empty after death.

JELLY.—Many types of nourishing food can be made up and taken as a jelly, and in this way they will be found very easy to swallow and very easy to digest. A special supplement has been devoted to DIET AND INVALID COOKERY in which some interesting recipes for jellies will be found.

JIGGER.—The jigger-flea is also known as the chigoe, or sand-flea, and it is found chiefly in tropical countries. The female burrows under the skin, especially between the toes and under the soles of the feet, to lay her eggs. When the eggs become hatched out, they produce a severe irritation which may proceed to serious ulceration and inflammation.

JOINTS.—Joints or articulations in the body are formed when two bones or cartilages meet. The joints of the body are divided into two groups: the fixed joints which have no power of movement, and the movable joints.

Fixed joints are those like the joints between the bones of the skull and the vertebræ of the spine, where there is a layer of cartilage between the two bones, binding them together, but not permitting movement to any noticeable extent. In the spine the result of a long series of little bones with flexible cartilage joints between them is to make the whole spine slightly flexible, but this is not true movement.

Movable Joints.—To make up a movable joint four different structures are necessary: the two bones, the layer of cartilage which covers the end of each bone, a capsule of fibrous tissue which holds the bones together and, lastly, the lubricating fluid—called *synovial fluid*—which oils the movements of the joint.

Joints, Diseases of.—Joints are very subject to injury and strains, and dislocations are very frequent. These injuries always require careful treatment, as when once infection gets into the cavity of a joint it is very difficult to treat it and serious illness may be the result and perhaps the permanent stiffening of the joint.

Inflammation of the lining of the cavity of a joint is called synovitis. (*See also* DISLOCATION; ELBOW; KNEE; SYNOVITIS.)

Tuberculous disease of a joint.—Tuberculosis may attack a joint and is characterized by a stiff swelling of the joint, which is sometimes called 'white swelling." It is much commoner in children than in grown-ups. Hip-joint disease is usually tuberculous in origin; gout, rheumatism and arthritis are all important agents in causing joint disease and stiffness. Hysterical states affecting such joints as the knee and hip are not uncommon. These diseases will be found described under their own headings. (*See also* TUBERCULOSIS.)

Varieties of Joints.—Movable joints are divided into groups according to their range of movement. The most freely movable joint is the *ball and socket*, like the hip or shoulder in which one bone has a rounded head like a ball which fits snugly into a cup-shaped socket in the other bone, and allows movement in every direction. Joints in which the movement is mainly in one direction, as in the wrist and ankle, are called *gliding joints*. *Hinge joints*, which include the knee and the elbow, move chiefly round one axis like a hinge.

JUGULAR VEIN.—There are three large veins on each side of the neck, known as the anterior, external and internal jugular veins. It is the duty of these veins to carry blood from the head and neck regions to the heart. The most important of the three is the internal jugular vein which collects the blood from the brain and part of the face and neck. The anterior and external jugulars lie very near the surface of the skin, and wounds of the neck may involve these veins and cause

severe bleeding. (*See also* BLEEDING; FIRST AID SUPPLEMENT; HÆMORRHAGE; NECK.)

JUICE.—Any of the fluids produced by organs of the body may be referred to as juice. For example, gastric juice is made by the stomach and it contains ferments which are necessary to the proper digestion of protein food and the clotting of milk. Intestinal juice contains ferments which deal with the digestion of carbohydrate foods; while pancreatic juice, by means of its ferments, assists in the digestion of starches and fats. The three types of foodstuffs, carbohydrates, proteins, and fats, are all dealt with and digested in the course of their journey from the mouth. (*See also* DIGESTION; FERMENTS.)

JUNIPER.—The juniper is an evergreen shrub found in many parts of the British Isles, from which is obtained an oil not unlike turpentine in smell. It is a valuable drug in the treatment of the type of dropsy due to diseases of the heart or liver, but it should be used with care as it is particularly irritating to the kidneys. The flavour of gin is due to the small quantity of juniper it contains.

Oil of cade is also known as juniper tar-oil and it is obtained by distilling the branches and stems of the juniper tree grown in the south of France. This oil is used as an antiseptic in various skin diseases.

JUNKET.—Junket is milk which has been acted upon by rennet so that it forms a soft curd which is much more easily digested than plain milk. It also lends itself to delicate flavouring so that an invalid does not tire of it as easily as of milk. It is thus an excellent food for invalids and patients who are on a milk diet as, for example, after a gastric ulcer. (*See also* CASEIN; CURDS; SUPPLEMENT ON DIET AND INVALID COOKERY.)

KALA-AZAR.—Kala-azar is a disease in which the chief symptoms are enlargement of the spleen, wasting, and intermittent fever. The infection is due to a very tiny parasite which is transmitted to human beings by the bite of a sand-fly. The condition seems to flourish in warm, moist climates, especially in parts of India, China and West Africa. Infantile kala-azar is found along the shores of the Mediterranean.

Symptoms.—In some cases the onset of the fever is very suggestive of malaria, while other cases may resemble typhoid fever. The disease usually starts insidiously with a gradually increasing feeling of weakness, and the body becomes wasted in appearance. Diarrhœa and sweating may be present, also bleeding from nose and gums. The spleen is enlarged and the temperature very irregular.

Treatment.—The death-rate has been greatly lowered by injections of sodium antimony tartrate solution in freshly prepared sterile water. An untreated case may go on for as long as two years, when death usually takes place from wasting and weakness, or some septic complication.

KAOLIN.—Kaolin is also known as china-clay or white clay. It consists mainly of a natural silicate of aluminium which is powdered and freed from gritty particles. It is sometimes used as a protective application in cases of eczema or other skin diseases and it is also used as an ingredient of the modern type of poultice like antiphlogistine. Internally it is an excellent remedy, mixed with water, for diarrhœa, food poisoning and dysentery, one or two tablespoonfuls taken every hour until the symptoms abate.

KELOID.—An overgrowth of tissue, usually occurring at the site of a scar is known as a keloid. The scar does not shrink in the ordinary way but tends to remain raised up, and the surrounding tissue becomes wrinkled. The raised surface may be white but more often it remains pinkish in colour. The best way to remove the disfigurement is by exposure to sunlight, X-rays or radium. Surgical treatment may be carried out, but there is the possibility that the fresh scar may also become keloid.

KERATITIS.—Inflammation of the part of the eye known as the cornea is termed keratitis or interstitial keratitis. There is a gradual mistiness of vision until the entire cornea presents an opaque appearance. Later, blood-vessels form and the cornea may become cherry-red in colour. Another form of this condition is known as keratitis punctata, in which opaque dots make their appearance on the back of the cornea. These dots generally appear in an easily recognized triangular formation. (*See also* CORNEA.)

KERATOSIS.—The term keratosis is used to denote any overgrowth of the horny layer of the skin. Ordinary corns or callosities may be looked upon as an exaggerated example of this condition. Keratosis senilis is the term applied to the roughening of the skin which occurs in elderly people. (*See also* CALLUS; CORN; SKIN.)

KERNIG'S SIGN.—A sign which is always present in meningitis was first discovered by a Russian physician of the name of Kernig. It is found that while the patient is lying flat on the back with the thighs raised and the knees bent, it is impossible for the patient to extend the leg straight at the knee-joint. Kernig's sign is also present in cases of sciatica. (*See also* MENINGITIS; SCIATICA.)

KETOGENIC DIET.—The ketogenic diet is a new diet designed by Dr. Clark, of the Mayo Clinic in America, first for the treatment of epilepsy, and quite recently for the treatment of certain infections of the kidneys and urinary tract. It arose from the observation that fits in epilepsy were often lessened by starving the patient and so causing "starvation acidosis"; similar acidosis was brought about, with chemical changes—"ketones"—in the urine and breath, by putting the patient on a diet very rich in fats and low in carbohydrates and proteins. It was also found that the increased acidity and the ketones in the urine brought about by this diet stopped the growth of colon bacilli in the urine and so cured infections in the kidney and urinary tract caused by these germs. A typical ketogenic diet for an adult is as follows, with variations on the same lines:—*Breakfast:* cream, fat bacon, two eggs, butter, milk, one diabetic biscuit. *Lunch:* ham or fish, beans, green vegetables, butter, mayonnaise, olive oil, one diabetic biscuit. *Tea:* one diabetic biscuit or vitaweat, butter, tea, cream. *Dinner or Supper:* beef-steak, butter, tomatoes, spinach, apricots, cream.

KIDNEYS.—The kidneys are a pair of glands placed in the back of the abdomen just below the waist-line on either side. Their function is to collect certain waste materials from the blood and the spare water from the tissues in the form of urine. The urine is then passed by the kidneys by way of the two tubes called the ureters to the bladder and thence by the urethra to the exterior. It is obvious, therefore, that the kidneys must be kept in good working order if the body is not to be poisoned with waste materials.

The kidneys are usually described as bean-shaped, being slightly narrower in the middle with bulging ends, much the same shape as a bean. Each kidney is about four inches long and a couple of inches across and an inch thick. On the inner border there is a crack called the *hilum* where the renal vein and artery and the lymphatic glands and nerves that supply the kidney enter and leave it. The tough coat of fibrous material which covers the kidney is called the *capsule*. The kidney itself is made up of two distinct layers of tissue, the outer being called the *cortex* (bark) and the inner the *medulla*. At the upper portion of each kidney a small gland called the *suprarenal* gland or *adrenal* is attached. These are ductless glands and are of great importance in the correct working of the body. (*See also* DUCTLESS GLANDS.)

Position of the Kidneys.—The kidneys lie on each side of the backbone on the back wall of the abdomen under the waistline. As a general rule the large mass of the liver pushes the right kidney farther down into the abdominal cavity than the left kidney. This does not interfere with the working of the organ in normal cases. The bowels lie in front of the kidneys. The kidneys are firmly embedded in a covering of fat and depend for support in their position on the organs around them and will, therefore, be involved with the other abdominal organs in the condition known as visceroptosis or dropped stomach.

Displaced and Floating Kidney.—One or both kidneys may become displaced from their normal position, usually as a result of general laxness of the front wall of the abdomen in women who have had several pregnancies. As a general rule the condition causes no inconvenience. Sometimes there is a kidney which is insecurely attached to the neighbouring organs and sudden acute pain with perhaps sickness and faintness may occur from time to time owing to its sudden displacement.

Treatment.—Often it is sufficient to change the position and the pain passes off; or, if it is very troublesome, an operation may be performed to fix it. A great deal of unnecessary fuss is made by young nervous people about these so-called floating kidneys. The best cure for them is to fatten up, so that the pads



THE KIDNEYS AND THE URINARY SYSTEM

The Kidneys are shown in their position on the posterior wall of the Abdomen, the right Kidney being cut open to show its Pelvis and the Ureter coming from it

A—Lung
B—End of Œsophagus
C—Vena Cava
(the great vein of the Abdomen)
D—Suprarenal Gland
E—Left Kidney
F—Adomin[illegible]
G—Ureter
H—End of Large Intestine
I—Urinary Bladder

of fat may keep the kidneys more securely anchored. This treatment, unfortunately, is often scorned by the thin "nervy" type of person who is most inclined to worry about floating kidneys.

Kidney Diseases.—The pain from kidney troubles is felt very typically in the back of the loins, and pressure there will sometimes relieve the pain temporarily. Perhaps the most common disease of the kidneys is the chronic inflammation known as Bright's Disease or Nephritis. This is described under its own heading. The kidneys are very subject to *stones* or calculi. The presence of a stone may pass unnoticed until it begins to move and pass towards the bladder, when there may be attacks of excruciating pain as it passes down the narrow ureter. The remedy is to have the stone removed by operation if it does not pass naturally. Where there is any tendency to kidney troubles the kidneys should be kept well flushed by means of drinking copious draughts of water between meals; but it should be ascertained, as well, whether the water of the district is suitable for kidney cases. In some neighbourhoods kidney trouble is much more common than in others and it is customary to blame the water for the increased number of people who suffer from "stone."

Tuberculosis may affect the kidneys and if one only is affected it may be removed with benefit to the patient. Tumours and cancer also affect the kidneys. (*See also* CALCULUS; NEPHRITIS.)

KING'S EVIL.—This term was used a great deal in the olden days in connection with the disease known as scrofula, in which the lymphatic glands of the neck became enlarged. It is now considered to be a form of tuberculosis. The term king's evil arose from a superstition that the disease was supposed to be curable by the touch of the king's hand.

KINO.—The dried juice of a tree grown in India and Ceylon. It is prescribed in some cases of diarrhœa. This drug has astringent properties which means that it is capable of contracting the tissues; it is often used for relaxed throats. (*See also* ASTRINGENT.)

KLEPTOMANIA.—This is the name given to a mental state in which the patient is unable to resist the temptation of stealing things. Very often the articles which are stolen are of very little value and in this way the condition differs from the mental state which drives some people, especially collectors, to possess certain objects.

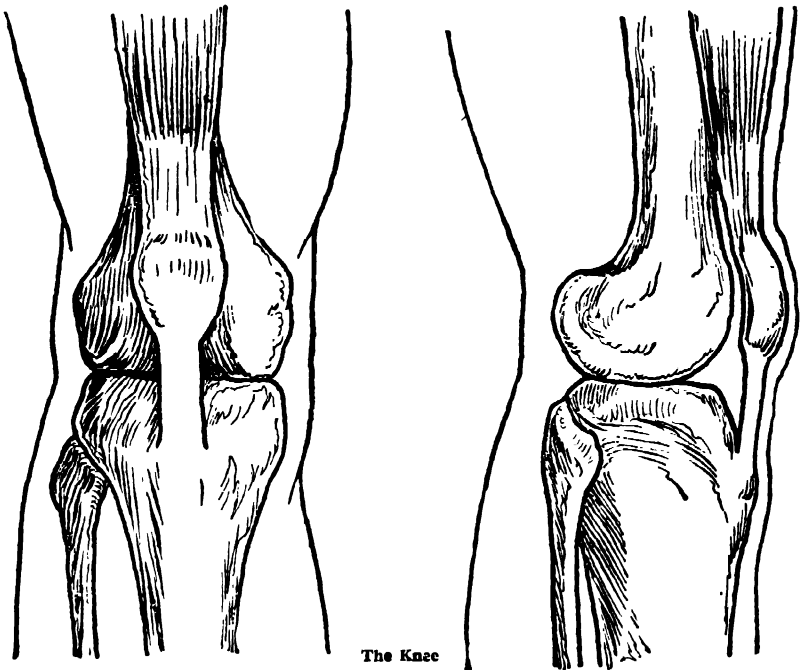
There is no doubt that this form of madness is taken advantage of by those who make a living out of thieving, and the conviction of such people is a difficult point for the law to decide. The treatment of kleptomania lies in a mental analysis of the individual; and the modern treatment by psycho-analysis may do much to bring to light the underlying motives which cause the impulse to steal. (*See also* PSYCHO-ANALYSIS.)

KNEE.—The knee-joint is the joint between the upper and lower bones of the leg, that is, the thigh-bone or femur, and the shin-bone or tibia. The other and smaller bone of the leg, the fibula, does not come into the joint but becomes associated with the shin-bone at a point lower than the knee.

Unlike other joints the bones that are connected by the knee-joint are not fitted into each other. The thigh-bone has two knobs which rest on flat places on the end of the shin-bone. Cartilage covers the ends of the bones and there is a large pad of fat in front of the joint and a small plate of bone called the knee-cap or *patella*. Between the knee and the smaller leg bone, the tibia. there are two pads of cartilage called, from their shape, the *semilunar cartilages*. The strength of the joint depends very largely upon the firm binding of muscular tissues and the strong ligaments. Behind the knee the muscles of the leg, coming down the thigh and up the leg, leave a small diamond-shaped space between them called the *popliteal* space.

Movements of the Knee-joint.—The movements of a normal knee are those of an ordinary hinge joint with a little additional movement made possible by the fact that the tibia is detached from the joint. When the knee is straightened the whole leg forms a straight and rigid column, and the tibia, by a separate movement of its own, locks the limb in position. When the knee is bent backwards and forwards it is an ordinary hinge joint, the locking movement of the tibia coming into play only at the moment of the complete straightening of the limb. This complicated mechanism is to provide a strong support for the body's weight. Like other joints the knee in health is well provided with the lubricating fluid called synovial fluid, which enables easy movement of the limb without undue wear and tear.

Diseases and injuries of the knee.—The knee is the most complicated joint in the body and it is very difficult to get at it for treatment purposes. As the knee is essential in our movements of walking and sitting it is obvious that a small injury to it may cause a large amount of disability. The joint may become infected with germs whose rapid spread may cause very serious illness. The diseases that affect other joints of the body also affect the knee joint. These are found under their own headings, such as ARTHRITIS; SYNOVITIS; TUBERCULOUS SWELLING.



The Knee



Patella (natural size)

Injury to the semi-lunar cartilage causes a

great deal of pain and temporary disablement. It is a very common thing for the semi-lunar cartilages to be dislocated in games such as football. The knee-cap, too, is readily dislocated, but total dislocation of the knee is very rare and is only the result of great violence.

Housemaid's Knee.—The condition commonly called housemaid's knee is a swelling of the bursa or sac of fluid in front of the knee. The swelling is due to continual pressure on the bursa such as that caused by the kneeling work of a housemaid. In order to prevent housemaid's knee it is wise to use a mat when kneeling for any length of time. (*See also* BURSITIS.)

Knock Knee.—Knock knee is medically termed *genu valgum* and is the opposite of bow leg, in that the legs turn inwards at the knee instead of bandying outwards. (*See also* KNOCK KNEE.)

KNEE JERK.—If the knees are crossed and a light tap is given with the tips of the fingers on the front of the knee just below the knee-cap, the leg is seen to make a sudden jump forward. This is known as the knee jerk. In certain diseases of the nervous system this action does not occur, and it is very often of great importance to the doctor when he is making his diagnosis.

KNOCK KNEE.—This is a deformity of the lower limbs medically known as *genu valgum.* When the feet are placed together it will be found that the space separating the ankles is abnormally wide, and as a result the knees knock together when walking. Sometimes the inner part of one knee may be more prominent than the other, but as a rule both knees are affected.

In young children, knock knee is practically always due to rickets owing to undue weight being put upon the soft bones. Prolonged standing in a rapidly growing child will often bring about a condition of flat-foot, resulting in knock knee. The condition may also be seen in young boys who, in the first place, do not possess a strong constitution, but whose work compels them to carry heavy weights.

Treatment.—In young children the treatment is, firstly, the general treatment for rickets. Massage and manipulation of the limbs will help to straighten them out, but this is only helpful in very young children whose bones have not yet hardened. In more advanced cases splints may be worn, or a special boot with walking irons may be found beneficial. In very severe advanced cases, operative treatment is the only means of straightening out the limbs. (*See also* KNEE.)

KNUCKLE.—The knuckles of the hands are the joints which connect the hand with the fingers. When the fist is closed, the knuckles of the four fingers can be seen to stand out very prominently, but the knuckle of the thumb never shows up to any great extent. In babies, a row of dimples usually replaces the knuckles. (*See also* FINGERS; HAND.)

KOCH'S BACILLUS.—Robert Koch, a German bacteriologist (1843–1910), was the first to discover the germ which causes tuberculosis. After years of patient research work he found that tiny rod-like organisms were present in every case of consumption, and as a result of his discovery many diseases which were then unnamed were able to be classed as definite cases of tuberculosis. The term Koch's bacillus is now applied to the tuberculosis germ. (*See also* TUBERCULOSIS.)

KOLA NUT.—The seeds of the kola tree which grows in various parts of Africa are used in medicine because of their stimulating action. They contain quite a large amount of a drug called caffeine and also some theobromine. The kola nut is used as the basis of a beverage and it forms a useful tonic and pick-me-up. (*See also* CAFFEINE.)

KORSAKOFF'S PSYCHOSIS.—This is a term applied to a mental disorder which is caused by taking too much alcohol. The chief symptoms are those of confusion as to time and place, and the patient will often fill in lapses of memory with statements which are far from being the truth. The condition is often closely associated with alcoholic neuritis. (*See also* MENTAL DISEASE; NEURITIS.)

KOUMISS.—The original koumiss of the Tartars was made by the fermentation of mares' milk, but nowadays it may be prepared from other kinds of milk. It is a stimulating and nourishing food, and because it is easily digested, it is greatly used in the treatment of disorders of the stomach or bowel. To prepare koumiss at home mix 3 pints of sweet milk with two pints of buttermilk and add half an ounce of sugar. Mix thoroughly, place in a bowl, cover with a cloth and leave in a warmish place for one day. Then bottle the milk, cork, and tie the corks down with wire. Leave the bottles in

the kitchen for three days, shaking them at frequent intervals. The koumiss is then ready for use and should be stored in a cool place.

KRAMERIA.—Krameria root, also known as rhatany root, is obtained from a plant which grows in South America. It contains an astringent substance and is greatly used in the treatment of diarrhœa and to make lozenges for use in cases of relaxed throat.

KYPHOSIS.—Kyphosis means humpback or curvature of the spine with the prominent part of the hump directed upwards. A slight form of this condition is more commonly known as round shoulders. This condition is usually due to faulty habits of standing and can easily be corrected by the mother or teacher. It may also be found in rickety children or in children afflicted with adenoids; or sometimes bad eyesight will cause a child to stoop forward in a peering attitude.

In adults, round shoulders may result in those who have to stoop constantly over their work. Rheumatism, especially rheumatoid arthritis, is a very common cause of this condition. When children are born, the spine is shaped in a very definite curve which disappears as growth proceeds, but in old age it is seen that the spine again reverts to its curved position.

Treatment.—In young children the defect can be prevented by insisting on correct posture, and by seeing that stooping is avoided when the child is sitting down. Any underlying condition such as rickets, adenoids, or bad eyesight should be given attention, and the general tone of the system should be stimulated by plenty of fresh air, good food, plenty of sleep, and sufficient exercise of the right sort. Once the condition of curvature of the spine has become established it must be treated by special remedial exercises. (*See* SPECIAL SUPPLEMENT ON EXERCISE; REMEDIAL EXERCISES.)

LABOUR.—Labour is the name given to the act of childbirth, and is usually looked upon as divided into three stages. The *first stage* begins with the onset of "labour pains," due to the regular, rhythmic contractions of the muscular walls dilating gradually the mouth of the womb; at first the pains come on about every quarter of an hour or twenty minutes, but the interval gets shorter and shorter and the pains become stronger and stronger; this stage may last for 24 hours or more in a woman who is having her first child, but usually lasts a much shorter time in a woman who has borne children. The *second stage* is one in which the mouth of the womb has become fully dilated and the child is being expelled from the womb to the exterior; this stage usually lasts about three or four hours in a first childbirth, but lasts a much shorter time—sometimes only a minute or two—in a woman who has previously had a child; during this stage the pains become more and more severe, and it is at this stage that chloroform or another anæsthetic is usually administered to ease the pains, which are worst just as the head of the child is being born. After the child is born the doctor or nurse cuts and ties off the umbilical cord, which connects the navel of the child to the afterbirth or placenta, the structure which is attached to the mother's womb and supplies the infant with nourishing blood while it is still in the womb. The *third stage* of labour consists in the delivery of the afterbirth or placenta, which usually comes away, accompanied by a few slight pains and some bleeding, within half an hour of the birth of the child.

Complications of Labour.—Complications of labour are not very uncommon, the most usual being a "breech presentation" of the child, i.e. the child is born buttocks first, instead of head first; this happens rather less than about once in every twenty labours, and while there is no increased danger to the mother in this complication there is an increased danger to the life of the child, so that a doctor should always be at hand when the nurse finds out (as she can by a simple examination) that the child is being born buttocks first. Other complications consist in other abnormalities of position of the child, such as a "face presentation" or a "cross-birth," but these are very rare. *Hæmorrhage* or bleeding during the third stage of labour, may be unduly severe, and if so, in the absence of expert assistance an

attempt should be made to stop it by kneading the womb through the abdominal wall and raising the foot of the bed on a chair; no stimulants should be given. *Convulsions* during or immediately after labour usually denote "eclampsia," which is a serious complication, requiring immediate attention by a doctor. *Fever* after labour may be due to blood-poisoning and in that case is very serious; a doctor must be called immediately. (*See also* CHILDBIRTH; PREGNANCY; SPECIAL SUPPLEMENT ON BABY.)

LABYRINTH.—The Labyrinth comprises not only an essential part of the organ of hearing, the internal ear or cochlea, but also the sense organ of balancing, in the three delicate semicircular canals. The labyrinth consists of two parts: the *osseous labyrinth* and the *membranous labyrinth*. The osseous labyrinth is a series of cavities hollowed out of the bone, comprising the vestibule, the semicircular canals and the cochlea, and the membranous labyrinth consists of a series of communicating sacs and ducts enclosed within the bony labyrinth. (*See also* EAR.)

LACERATION.—A laceration is a tear in the flesh such as may be produced by injuries from machinery, etc. The more clean-cut type of wound is called an incision and it is not such a complicated type as a laceration. (*See also* WOUND.)

LACRIMAL APPARATUS.—The tears and watery secretions from the eye all come from the lacrimal gland which is situated behind the outer part of the upper eyelid. By means of the lacrimal ducts or canals, moisture is continually being carried to the eye, which aids in the cleansing of that organ.

LACTATION.—Lactation is the period during which the child is suckled at the mother's breast. (*See* article on INFANT FEEDING in the SPECIAL SUPPLEMENT ON BABY, at the end of this book.)

LACTEAL VESSELS.—The lymphatic vessels of the intestine are referred to as the lacteal vessels because of the milky appearance of their contents. (*See also* DIGESTION; INTESTINE.)

LACTIC ACID.—This is a colourless, thickish, sour liquid which is produced by the action of certain germs upon milk. The growth of these germs produces lactic acid, and in this way milk is made sour.

Lactic acid, or soured milk, is very often of use in the treatment of disorders of the intestine, such as summer diarrhœa and colitis. Tuberculous ulcers may be treated with good results by applying pure lactic acid with a brush. Certain skin diseases may be treated in the same way.

The lactic acid germs can be procured in suitable tablets for use when required. These are added to freshly-boiled milk which has been allowed to cool, and in a little time a junket will form. This can be eaten with cream and sugar, or with sugar and a little powdered cinnamon or ginger as flavouring. (*See also* JUNKET; KOUMISS; MILK.)

LACTOMETER.—This is an instrument which is used for ascertaining the specific gravity of milk. By its use watered milk can sometimes be detected.

LACTOSE.—Lactose is the technical name for the sugar of milk.

LAMELLA.—A thin small disc made of gelatin and glycerine which contains an active drug for application to the eye, is known as a lamella. The lamella is placed over the white of the eye, the eye is then closed and the disc allowed to dissolve. The four official lamellæ are those containing atropine, cocaine, homatropine and physostigmine.

LAMENESS.—Lameness may be due to many causes, ranging from pain caused by a corn on the toe to the more serious conditions, such as paralysis and so on. Many people have a slight limp owing to stiffness in the joints caused by rheumatism. In children, one of the conditions which causes serious lameness, and which may not improve in adult age, is hip-joint disease; infantile paralysis is also responsible for lameness and deformity. Special attention should be given to the type of footwear worn, as badly-fitting shoes may cause serious damage to the feet, thus causing intense pain and lameness. (*See also* BOOTS AND SHOES; HIP-JOINT DISEASE; RHEUMATISM.)

LAMINA.—This term indicates a thin plate or layer, and the word is used in medicine in connection with many structures of the body, particularly to describe any tissue which exists in thin layers.

LANCE.—The word lance is an abbreviated form of lancet, which is an instrument formerly used by surgeons when making incisions into the tissues. The type of knife now used by surgeons is known as a scalpel, but the old term "to lance a boil," etc., is still very much in use. Young children sometimes

have their gums lanced when there is difficulty in teething, but this old-fashioned treatment is rather frowned upon nowadays.

LANGERHANS' CELLS.—Little masses of cells which are scattered throughout the pancreas and which are responsible for pouring out a substance which enables the body to use up its carbohydrate food, are known as the islands of Langerhans, so called after Ernst Robert Langerhans, a German, who was the first to describe them. In the condition known as diabetes, these cells become diseased and are no longer able to carry out their work, thus the body becomes overloaded with carbohydrates (sugar, etc.). Insulin is an extract of the islands of Langerhans taken from the pancreas of the ox, and it is used in the treatment of diabetes. (*See also* DIABETES; INSULIN.)

LANGUOR.—Languor is a state in which the body feels listless, and there is a decided disinclination to take any bodily exercise, or to exert oneself. It may be a symptom of illness and it is often present in anæmic conditions or in cases of indigestion. After any serious illness, the patient is usually in a languorous state for a week or two during convalescence. A feeling of listlessness may be brought on by lack of fresh air or insufficient sleep, or it may be temporarily produced by over-eating or hot weather. If, however, the feeling of languor is a persistent one, a change of surroundings with plenty of fresh air and good food may do much to stimulate the system. (*See also* CONVALESCENCE.)

LANOLIN.—A fat obtained from the wool of the sheep is known as lanolin, and it is a useful and soothing ointment. When rubbed on the skin it is believed to be more quickly absorbed than most fats, and because of this, it forms a basis for other substances such as mercury, etc. It is able to be kept over a long period of time as it does not turn rancid.

LAPAROTOMY.—The operation of cutting through the abdomen for the purpose of dealing with any of the internal organs, is known as laparotomy.

LARD.—Lard is the purified fat of the pig, and it is contained in many ointments; but in India, prepared suet is used in its place. Like lanolin, it penetrates the skin easily and is non-irritating, but it has the disadvantage that it is liable to turn rancid on keeping. Lard is very useful as a cooking fat and is very cheap to buy. (*See also* LANOLIN.)

LARDACEOUS DISEASE.—A disorder in which certain substances resembling starch are found in the tissues, usually due to long continued suppuration or to tuberculosis or syphilis. (*See also* AMYLOID DISEASE.)

LARVA.—When the egg of an insect hatches out it is called a larva. For example, the egg of the common house-fly hatches out into a maggot, and a caterpillar is the larva of the butterfly. This larva stage is more popularly known as the grub stage.

LARYNGISMUS STRIDULUS.—A spasmodic condition of the larynx in which the breath is suddenly caught, followed by a loud crowing noise as the breath comes back. It is most common in children with rickets, but may also occur as a symptom of laryngeal catarrh. (*See also* CROUP.)

LARYNX.—The larynx is the organ of speech, though speech is said to be a later development, and the earliest use of the larynx in primitive beings was to shut off water from the lungs. Man, however, being no longer amphibian, uses the larynx to communicate with his fellows. The position of the larynx is at the Adam's apple in front of the neck; it consists of a large *thyroid cartilage* (the part which projects as the Adam's apple), a ring cartilage, or *cricoid* below it, a pair of tiny *arytenoid* cartilages placed on the edge of the cricoid, at the back, and the *epiglottis*, which sticks out above the larynx and protects it. Various ligaments bind the cartilages together, and there are several small muscles situated within it which have the important function of moving the vocal cords, under the control of the *recurrent laryngeal nerves*, which are branches of the important *vagus* nerve. The *vocal cords* are tense ligaments attached to the arytenoid cartilages, and as they move to and fro and vibrate, the voice is produced by air passing through the chink between them.

Larynx, Diseases of.—Disease of the larynx usually shows itself first by hoarseness, which may be so marked that the voice is completely lost. The usual cause of *acute laryngitis* is the extension downwards of a cold or influenza, and it may be accompanied by severe pain deep in the throat; it is best treated by keeping the patient in bed (if the temperature is raised) and giving him ten grains (two tablets) of aspirin every four hours, also inhalations of Friar's balsam

(one teaspoonful in a pint of boiling water, the steam being inhaled), or menthol, and cold applications (towels wrung out of cold water, or else an ice-bag) to the neck. *Chronic laryngitis* is usually caused by overuse or bad production of the voice, and happens most often in professional singers, actors or actresses, clergymen or schoolteachers. The essential in treating *chronic laryngitis* is to rest the voice—if necessary by keeping silent altogether for a time. A nasal douche (bicarbonate of soda and common salt, half-and-half, use half a teaspoonful of this powder in a half-pint of cool water and sniff it *gently* through the nose) often helps chronic laryngitis by keeping the nose clear; smoking is bad for this condition and alcohol is worse. A throat specialist can spray the larynx with weak cocaine or with adrenaline, and paint the vocal cords with weak perchloride of iron solution, weak silver nitrate solution or an oily preparation like gomenol; but such methods of treatment require special skill and experience.

If a person loses the voice for more than a month the larynx should *always* be examined by a throat specialist; it may only be a simple chronic laryngitis, but it may be something more serious, for the larynx is sometimes affected by tuberculosis or by cancer, which can only be treated successfully at an early stage of the disease. (*See also* BRONCHITIS; INFLUENZA.)

LASSAR'S PASTE.—A paste used in the treatment of eczema, etc., consisting of salicylic acid, zinc oxide, powdered starch and vaselin. It was named after Oscar Lassar, a German skin specialist. It is a very soothing and antiseptic paste, and other ingredients such as sulphur can be added if necessary.

LASSITUDE.—This indicates a state of weakness or exhaustion, arising from causes other than fatigue. One of the most common causes for this feeling is constipation. Any part of the body which has become a source of infection, such as bad teeth or tonsils, or an infection of the ear or nose, may give rise to a state of poison which brings with it a decided feeling of weakness. Many diseases which cause changes in the blood, thus bringing on a condition of anæmia, will also cause a very great lowering in the vitality, and the patient may feel in a permanently exhausted state. This feeling is very prominent during the onset of typhoid fever, and again, it is very marked after an attack of influenza. (*See also* ANÆMIA; DEBILITY; FATIGUE; LANGUOR.)

LAUDANUM.—This is a popular name for tincture of opium, though the origin of the name seems to be obscure. It is a drug which should never be given to children as they are very easily poisoned by it. (*See also* OPIUM.)

LAUGHING GAS.—Nitrous oxide which is given as an anæsthetic before undergoing a slight operation is commonly referred to as laughing gas, on account of the laughter it produces in those who inhale it. (*See also* ANÆSTHETICS.)

LAUREL.—The cherry-laurel, a tree which grows wild in Persia and Asia Minor, but which is cultivated in England, gives us a cherry laurel water which contains a small quantity of hydrocyanic acid. In small quantities, this has been used for making up soothing solutions, but it should be used with care as it is a dangerous poison.

LAVAGE.—Lavage, from the French word *laver*, to wash, is a term applied to the washing out of the stomach or other organs. This process is carried out in cases where the stomach is dilated owing to fermentation of the food contents, and also in cases when certain poisons have been swallowed, and in various other circumstances. Special rubber tubing is used for this purpose, and the stomach contents are run off by siphonage. Bicarbonate of soda, boracic acid or other substances are very often dissolved in the water if required.

Lavage of the bowel is very often carried out in the treatment of colitis by means of the Plombières method, which is described in the article on irrigation. Lavage of the bladder is carried out in the treatment of chronic cystitis by means of a rubber tube attached to a catheter, which is inserted into the bladder. (*See also* DOUCHE; ENEMA; IRRIGATION.)

LAXATIVES.—Laxatives are medicines which produce an action of the bowels, and they are given in the treatment of slight constipation. Aperient is another name for this type of drug, and it is the mildest form of purgative. (*See also* APERIENT; CATHARTIC; CONSTIPATION; PURGATIVE.)

LAYETTE.—The full outfit of garments, bedding, etc., for the new-born infant is

called a layette. (*See* SUPPLEMENT ON BABY at the end of this book.)

LEAD.—The salts of lead are used a great deal in medicine because they have a powerfully astringent (drawing together) action on the skin. The most important salts are the acetate, the iodide and the oxide; the acetate is the only one given internally. Lead acetate is used in cases of severe diarrhœa, and for bleeding from the intestine or stomach. For treating hæmorrhage of the rectum, special suppositories have proved of great value. Lead salts produce very marked constipation, hence their great value in the treatment of severe diarrhœa. The subacetate of lead may be used as a throat gargle, or painted on with glycerine, in cases of relaxed throat.

Solutions of lead salts, when applied to broken skin, to sores and to ulcers are particularly beneficial because they form a protective coating over the wound, and they contract the tissues, which helps to stop any further bleeding. Too strong a solution should be avoided as it may do harm by causing irritation; any salt is irritating if used in too concentrated a form. Goulard's water, which is the name for the dilute solution of subacetate of lead, is greatly used in the treatment of bruises, sprains and any local inflamed part of the skin. It is frequently mixed with laudanum and acetic acid for application in cases of sprain, but for this purpose any ordinary spirit would do just as well. Lead can also be used in ointment form for application in diseases of the skin. Diachylon ointment, which contains lead as well as other substances, is very good for chronic eczema, and for relieving itching of the skin. The infection of lead salts has been tried in the treatment of cancer with apparently occasional improvement in advanced cases but without real cures so far.

Lead Poisoning.—At one time, lead poisoning was very common in industry among people who came in contact with the metal, but nowadays Government regulations have been introduced which afford a great deal of protection. Nevertheless, chronic poisoning is very liable to affect those who deal with lead, such as lead-smelters, painters, glaziers, plumbers, and so on. On the other hand, lead may be introduced into the system by means of our food or our drinking-water. For example, a water supply may become contaminated by lead which has been dissolved from the pipes through which the water passes, or tinned foods may become contaminated by lead from the solder which seals the tins. Both these occurrences are, in fact, quite rare; but danger does exist as regards a water supply in cases where the water is of a peaty nature, or where it is contaminated by impurities, as both these instances give the water an added power of dissolving out lead from the pipes.

Not long ago, a form of poisoning known as "Devonshire colic" was very common in that part of the country, but it was eventually discovered that the poisoning was due to the fact that the cider, of which a great deal is taken, was made in leaden presses. Now that the cause is known, precautions are taken to prevent the contamination of the cider. Poisoning may also occur through breathing particles of lead dust in the air; formerly it was thought that the only way the lead was introduced into the body was with the food, because the workers did not wash their hands before meals. Certainly washing the hands, which is one of the compulsory measures introduced by the Government, forms a very important part in the preventive treatment of lead poisoning. Other measures which give protection include the changing of clothes, the use of respirators, the provision of suitable exhaust flues and electric fans, and the use of Epsom salts, milk, lemonade or sulphuric acid.

Symptoms.—In cases of acute lead poisoning where a large dose of lead has been taken either accidentally or with suicidal intent, the patient suffers from burning in the mouth, vomiting, cramps in the legs, severe pains in the intestine, and convulsions. Cases of acute poisoning are rare, but cases of chronic lead poisoning such as occurs amongst workers is so common that a full description is necessary.

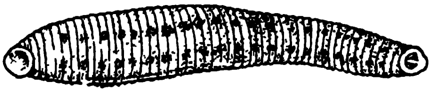
In chronic cases, the earliest symptoms are constipation and intestinal colic. The worker complains of lassitude and tiredness, and of vague pains in the arms and shoulders. Cramps may occur in the legs, and he may lose his power of concentration. The lead circulates through the blood and produces a state of anæmia which leaves the patient very pale, and the skin takes on a greyish tinge. A blue line may be seen on the gums at the base of the teeth, which is due to lead

sulphide being formed by putrefaction in the mouth. Lead very often produces chronic inflammation of the nerves which control the muscles, and any part of the body may be paralysed. It is very common for the muscles of the hand to be affected in this way, producing a condition known as wrist-drop. Inflammation of the nerves of the eye, or optic neuritis, may be present, and gout is a very common symptom.

Treatment.—In the treatment of lead poisoning the stomach should be emptied by an emetic such as mustard and water. Salts should be taken every four hours until the bowels are thoroughly cleared out. Potassium iodide was the drug which was formerly given in every case, but it has now been replaced by the parathormone or ammonium chloride treatment. The diet should be regulated by a medical man, as it is necessary to regulate the calcium in the system. The anæmia which results from the poisoning should be treated with an iron tonic. The intestinal colic is treated by hot fomentations, and if necessary the doctor may give an injection of morphia or some other drug. After the patient has been cured, he should, if possible, seek employment in some other type of work, especially if there is any sign of a recurrence of the symptoms. In cases of poisoning from contaminated drinking-water, every effort must be made to remove the source of the poisoning. (*See also* INDUSTRIAL HYGIENE; OCCUPATIONAL DISEASES.)

LEECH.—In the old days leeches were extensively used in the treatment of the sick; in fact, it may be safely stated that at one time leeches were applied to the patient as a matter of routine no matter what his ailment. They are very rarely used nowadays for bleeding a patient, though the method may be used on certain occasions. The five-striped Australian leech is the one which is officially used. A freshly-prepared extract from leeches has been given in the treatment of puerperal eclampsia in order to prevent the blood from coagulating.

It sometimes happens that leeches may accidentally become attached to the skin, or they may be lodged in the throat from drinking water. They can always be dislodged by pouring a strong solution of common salt over them, but no attempt should be made to drag them off. In the East, aspirin has been used to expel leeches from the stomach. If the leech-bites still continue to bleed, the bleeding-points should be touched with a stick of lunar caustic, or firm pressure may



Leech

be equally as effective. (*See also* BLEEDING; CUPPING.)

LEG.—Most people when they refer to the leg include the whole of the lower extremity; but, medically speaking, the leg extends from the knee to the ankle, the upper part of the limb being the thigh. (*See also* ACHILLES' TENDON; BONES; BOW LEG.)

LEG, ARTIFICIAL.—*See* article on ARTIFICIAL LIMBS.

LEISHMANIASIS.—A group of diseases due to infection with certain parasites known as protozoa of the Leishman-Donovan type is known as leishmaniasis. The group includes kala-azar and oriental sore (Aleppo button). In South America the oriental sore is known as espundia, and it is a condition in which ulcers may form inside the mouth and nose as well as on the skin. (*See also* ALEPPO BUTTON; KALA-AZAR.)

LEITER'S TUBES.—These are tubes of soft, flexible metal designed so that they can be applied to various parts of the body, especially the head. Cold water is passed through the tubes, thereby reducing the temperature of the parts encased by them. A long rubber tube is connected at one end to a water-tap, while at the other end, another tube carries the water into a sink. In this way a continuous stream of cold water can be assured.

The tubes are so flexible that they can be used to fit the head, and they are often beneficial in relieving the severe headache and delirium which accompany many fevers. They are also used for relieving pain in the abdomen and chest when it is found that cold is more efficacious than heat.

LEMON.—The juice of the lemon contains a large percentage of citric acid and other acids which are very valuable in preserving the alkalinity of the blood. It will be found that many people who suffer from indigestion obtain great relief after taking the unsweetened juice of a fresh lemon. This is due to the fact that the indigestion may have been caused by over-acidity of the stomach,

which is immediately rendered alkaline by the lemon juice. The lemon also contains vitamin C, which is known as the anti-scorbutic vitamin, and it is greatly used in the prevention and cure of scurvy.

Fresh lemon juice, usually made up as home-made lemonade, is given as a cooling drink in fevers. A refrigerant is the name given to a medicine or agent which has cooling properties and is able to lower the temperature of the body. Besides being of great value in medicine, the lemon and its juice are widely used in cookery as a flavouring agent. A thin slice of lemon taken in tea instead of milk is particularly refreshing and far more digestible. Puddings can be made more appetizing and interesting if a piece of the rind, which contains a number of aromatic substances, is added to them. Oil of lemon is also used as a flavouring agent.

Not the least important are the toilet or cosmetic uses of the lemon. Its bleaching properties make it invaluable for removing stains from the skin. For application to the face, the juice may be patted on at night and bathed with cold water the next morning. For removing stains from the fingers use one half of a lemon and rub the stains thoroughly for at least two minutes. Lemon juice will also be found useful for getting rid of wrinkles or crowsfeet, as it has an astringent (drawing together) action on the skin. It is also beneficial as a hair brightener and should be used in the last rinsing water. (*See* CITRIC ACID; SPECIAL SUPPLEMENT ON BEAUTY CULTURE at the end of this book.)

LENS.—The lens of the eye, which is situated behind the pupil, acts, by the bulging or flattening brought about by the ciliary muscle, by focusing objects at varying distances upon the retina. Over the age of about 40 it begins to lose its power of focusing and spectacles may be needed to help this. The disease called cataract is due to the lens becoming hardened and opaque. (*See also* EYE; SPECTACLES.)

LENTIGO.—A freckle, which is usually caused by exposure to the rays of the sun, is technically called lentigo. (*See also* FRECKLES.)

LEONTIASIS OSSEA.—An over-growth of the bones of the face, through which the features become lion-like in appearance, is known as leontiasis ossea. This lion-like appearance of the face is seen in leprosy and elephantiasis. It is believed that the abnormal growth of the bones is due to infection by some microbe, but the organism has not yet been identified. There is no treatment available for prevention of the growth, but the disease is not fatal.

LEPROSY.—Leprosy is a wasting disease caused by a germ, which especially affects the skin and nerves, and results in mutilations and deformities. It is infectious, and though nowadays very rare in Great Britain, is still found in many other countries.

Symptoms.—Its onset is insidious, four-fifths of the cases taking any time up to five years to develop. The patient may have intermittent attacks of fever, with aching of the bones, headache, and sometimes nose-bleeding. Finally, the spots on the skin, by which the disease can be recognized, appear. There are two types, the nodular and the maculo-anæsthetic (macula, a spot), which are often found together.

The nodular form appears as little yellowish-brown lumps or nodes, generally on the face, the backs of the hands and wrists, and the feet and legs. The nodes grow in number and size, and spread; until the face assumes a hideous, lion-like appearance. The mucous membranes of the mouth, nose, and throat are also affected, and the eyes. The voice becomes hoarse, and breathing may be difficult. The fingers and toes are first deformed and later drop off. This form generally lasts about 8 or 9 years, and ends fatally.

The maculo-anæsthetic type is much milder. It appears as reddish-brown spots, usually on the back and the limbs. At first there is increased sensitiveness and neuralgic pains, but as the disease progresses, anæsthesia of the affected skin develops. The hair and nails come off, the fingers and toes amputate, and the muscles shrink. This form may last 10, 20, or 30 years, and may pass into the nodular form and end fatally, or, quite commonly, recover, though the patient may be "only a miserable remnant of a human being."

Treatment.—The treatment is still on the whole unsatisfactory. Many remedies have been tried, the most useful being chaulmoogra oil, salicylate of soda, gold and silver salts and vaccines. Remedies may be given to relieve such symptoms as ulceration, but surgical methods are often required. The most important thing, however, is to *prevent*

the spread of the disease by raising the standard of personal and household hygiene, and to recognize early cases as soon as possible.

LESION.—A lesion is a wound, injury, or sore which causes changes to take place in the tissues of the skin. In many diseases the first symptoms are recognized by lesions on the skin, such as the chancre in syphilis.

LETHARGY.—A condition of drowsiness or stupor which may be due to disease or physical fatigue. The most prominent disease which induces this feeling of drowsiness is encephalitis lethargica. (*See also* COMA; FATIGUE; LASSITUDE.)

LEUCOCYTE.—The colourless or white cells of the blood are known as leucocytes. By means of microscopic examination (after staining with certain dyes), it is possible to pick out the different varieties of white cells, or corpuscles, as they are called. All leucocytes are able to move about, and they are formed in the lymphatic tissues (lymphocytes) and in bone-marrow. The normal number of leucocytes in a healthy person is from 7,000 to 8,000 per cubic millimetre of blood (i.e. in a space the size of a pin's head) and very important information can be gained by noticing changes in the proportions either one way or the other. An increase in the number of white cells in the blood is called leucocytosis, and a lessening of the number is referred to as leucopenia.

LEUCOCYTHÆMIA.—This is the old term for a permanent increase of the white cells of the blood. (*See also* LEUKÆMIA.)

LEUCOCYTOSIS.—This term means an increase in the number of white cells in the blood. In normal health this occurs after every meal and after taking a cold bath or exercise. In children the average number of leucocytes is greatly increased, especially in the first few days of life, and the same state of the blood is present in pregnancy. Leucocytosis is not a disease, but it is an indication that the blood is in a state of defence, ready to do battle and attack any invading germs of disease. The leucocytes, or white cells, do not live in the tissues but are found in the blood vessels; yet when any septic or inflammatory condition arises, the leucocytes find their way to the spot and begin their business of destroying the invading germs. As soon as these leucocytes leave the blood vessels, the bone-marrow immediately begins to manufacture a fresh supply, as it would be a very dangerous situation for the blood to be left unguarded in case another urgent call came from a different part of the body. During many acute infective diseases the number is largely increased. For example, in cases of pneumonia the number of white cells may be doubled and the patient is very well equipped to fight the infection, but if the infection has proved too strong and poisoned the bone-marrow so that it can no longer respond and carry out its work, the outlook may be very serious indeed. Habitual alcoholism very often leads to a severe poisoning of the system, which prevents the manufacture of fresh leucocytes when required, and it is for this reason that many diseases are so frequently fatal in drunkards.

This protective habit which the body has developed of rushing white cells to the area of septic infection, gives a great deal of aid to the doctor in diagnosing certain cases. For instance, an abscess may form in the abdomen where it cannot readily be examined, but the examination of a drop of blood may point out the necessity of an operation. There are a few conditions in which the blood does not respond and manufacture fresh white cells, such as typhoid fever, measles, mumps, malaria and influenza, but if any increase in the number is found to be present, it is an almost sure indication that there is an abscess forming in some part of the body.

LEUCODERMA.—A condition of the skin in which whitish patches appear is known as leucoderma. There may be no obvious cause for the condition, on the other hand, it may result from other skin diseases, or syphilis. The white patches are due to the removal of the colouring matter (pigment) in the skin, and the skin around the patches seems to take on the extra pigment, as it becomes much darker in colour than the normal skin. If a patch of leucoderma develops on the scalp, the hair growing on that area loses its colour, and the same applies to the hair on any part of the body where these whitish patches appear. The condition is incurable and treatment is not very satisfactory, but much can be done to hide the white patches with the aid of cosmetics. (*See also* ALBINISM.)

LEUCOPENIA.—A decrease in the number of white cells in the blood is known as leucopenia. This occurs normally in old age, and it also occurs after long exposure to cold or heat, and particularly after prolonged

starvation. It is also to be met with in tuberculosis, influenza, typhoid fever and malaria. The most marked leucopenia is found in splenic anæmia and pernicious anæmia. Exposure to X-rays or radium leads to a destruction of the blood cells, so it is important that anyone undergoing a course of treatment should be carefully watched and the blood examined at various intervals.

LEUCORRHŒA.—Any discharge which comes from the female genital passage which is not blood is termed leucorrhœa. It is usually of a whitish colour and is more commonly referred to as "the whites." The condition may occur in females of all ages and may vary a great deal in each individual.

In children, there may be inflammation and redness around the opening of the front passage as well as a discharge. The condition is usually caused by want of cleanliness, or irritation from threadworms. Fortunately the condition is easily cleared up. The parts must be thoroughly washed several times a day for a few days with some antiseptic lotion. Boracic acid will be found very soothing, or a solution containing enough potassium permanganate to colour the water a faint red, may be used with good results.

In grown-ups, unless the discharge is excessive, no special treatment is necessary, but the general health should receive attention. The condition may be caused by rheumatism or anæmia, and once these conditions are attended to, the discharge may completely clear up. The bowels must be kept open, as constipation tends to aggravate the condition. If the discharge is thick and milky in consistency and is in excess of the normal secretions which lubricate the genital passage, the condition may be due to inflammation of the womb following on childbirth. If the discharge is mixed with pus, it is an indication of the presence of an acute inflammation. This type of discharge may be due to gonorrhœa, or it may be due to irritation set up by the presence of a pessary which has been left in too long. An occasional watery discharge, apart from pregnancy, may be due to growths of a cancerous nature. It is always advisable for anyone suffering from a distressing discharge to consult a doctor as soon as possible and have a local examination carried out so that the right sort of treatment and cure can be assured.

Treatment.—When the discharge is due to weakness and debility much can be done by bracing up the system with the proper diet and fresh air. It is important that the bowels should be regulated, and a soothing douche carried out every day to cleanse the parts will be found very beneficial. At least a quart of water should be used to each douche, and antiseptic substances such as potassium permanganate (sufficient to tint the water a pink colour), boracic acid, hydrogen peroxide or tannic acid may be added to the water. If the condition is very severe or due to some definite disease, these measures will not effect a cure, and some special form of treatment may have to be carried out under the doctor's orders.

LEUKÆMIA.—This is a disease in which there is a persistent increase in the white cells of the blood. There are many other symptoms which accompany this condition, such as enlargement of the spleen and changes in the marrow of the bones, or enlargement of the lymph glands all over the body. There are two types of this disease: lymphatic leukæmia and myeloid leukæmia, according to the type of white cell present in the blood. The cause of the disease is not known and the diagnosis depends on a microscopic examination of the blood.

Myeloid leukæmia usually occurs after the age of twenty. The onset is very insidious and the condition may be quite advanced before it is noticed. Sometimes the enlarged spleen attracts attention by causing enlargement of the abdomen, but there are few cases that come under observation in the early stages. The changes in the blood are so characteristic that a diagnosis can often be made after a single examination. The leucocytes in the blood increase enormously in number, and later the blood may take on a grey tinge. Severe hæmorrhages may come from the gums and nose or perhaps from the stomach and other sites. Vomiting, diarrhœa and intestinal disturbances are very common, and when these occur the patient rapidly becomes worse. There is no cure for this condition and the disease may go on for about three years.

Lymphoid leukæmia is, fortunately, a much rarer disease, which appears to affect middle-aged or elderly people. The symptoms are very similar to myeloid leukæmia, but enlargement of the lymphatic glands is

often the first symptom which attracts attention. Examination of the blood shows a very increased number of the leucocytes, consisting almost entirely of lymphocytes (*see* article on LEUCOCYTE). The course of the disease is very slow, but towards the end the condition is one of extreme discomfort. (*See also* ANÆMIA; LEUCOCYTE.)

LEUKOPLAKIA.—A condition in which there are whitish patches on the surface of the tongue and inside the cheek is known as leukoplakia. It usually affects middle-aged or elderly men, and although the cause of the disease is unknown, it is thought to be due to excessive smoking or spirit drinking. As the condition advances, these raised-up patches may cause a considerable amount of pain, and the mouth and throat become dry. There is difficulty in swallowing and chewing, and the disease is important because it very often leads to cancer. Antiseptic mouth washes should be used, and some cases have been satisfactorily treated with radium.

LEVATOR.—Any muscle whose action is to raise or elevate a part of the body is termed a levator. For instance, with the help of the levator anguli oris we are able to raise the mouth when we smile, and there are many such muscles all over the face which alter our expression. (*See also* FACE.)

LICHEN PLANUS.—Lichen planus is an inflammation of the skin and mucous membranes characterized by papules or pimples. On the skin these favour the flexures or "bends," especially the wrists, the thighs above the knee, and the back of the neck. They are grouped into irregular, ringed, or linear patches. The pimples are flat, small, shiny, and mauve in colour. Older patches are brownish and scaly, except at the margins, where the characteristic pimples are seen. Several varieties of the disease are described. It is found equally among men and women, and most often in middle life.

The patient often feels very ill, though feverish symptoms are rare. His chief complaint is itching, which may be so severe as (literally) to drive him nearly mad. At times this seems to be out of all proportion to the small area of skin affected.

Sometimes the spots come and go rapidly, at other times they persist for months. The long-standing ones often cause a permanent brown discoloration of the skin, especially of the legs. The papules or spots in some cases tend to form along the lines of the veins, or along scratch-marks. The older scaly patches often resemble a skin disease known as psoriasis. In some cases warty growths appear.

The cause of the disease is unknown. Some experts say that nervous strain is a factor in its production, others that chronic poisoning from the bowel is to blame. It is certain that a simple diet greatly benefits patients; during the war, with its food restrictions, it was noticed that cases were fewer, and that after the armistice they once more increased greatly. The outlook varies, some cases recovering rapidly, others, more commonly, are prolonged. A widespread case may take six months; the patchy variety, especially on the legs, may persist for years.

Treatment.—The internal treatment is principally by arsenic and mercury, in the former cases with great care as to dosage. These cure successfully in many cases. An ointment containing carbolic acid and mercury perchloride is often very helpful; it tends to prevent the severe itching. X-rays in careful hands give good results. The diet should be simple, and alcohol and tobacco avoided.

LIENTERIC DIARRHŒA.—This is a nervous form of diarrhœa in which the food passes quickly through the bowel without undergoing digestion. It may be caused by some particular form of food, in which case such food should be avoided. In some cases lying down for half an hour after each meal will prevent the diarrhœa occurring. (*See also* DIARRHŒA.)

LIGAMENT.—A ligament is a structure which serves to bind together the bones at the joints. Some ligaments are made of white fibrous tissue which, although they are unstretchable, are quite pliant enough to allow of free movement. Other ligaments, formed of yellow elastic tissue, are able to stretch, and are found in those parts of the body where a considerable amount of movement is required. For example, these elastic ligaments serve to bind the back parts of the vertebræ and are stretched when we bend forward, and their tension helps the muscles to straighten the back from the stooping position. If undue strain is put upon the muscles, the ligaments then come in for their share of the strain, which often causes them to be torn or ruptured. The term ligament

is also used in connection with certain folds of the peritoneum which bind various internal organs together, for example, there is the ligament of the liver, also the ligament of the womb. (*See also* JOINT.)

LIGATURE.—When a blood-vessel is cut, the thread-like material which the surgeon uses to tie it together is called a ligature. The material used for ligatures is usually catgut, but for very fine vessels linen thread or silk may be employed. (*See also* CATGUT.)

LIGHT TREATMENT; ARTIFICIAL SUNLIGHT.—The sun is not only the source of all light, but also maintains all animal and vegetable life.

Its healing and health-giving properties were better appreciated by the ancients than by later European nations. Thus we read that in the beginning of history the Aryans worshipped the sun, or "Dyaus," from which word is derived the Latin *deus*, and thence our own word *deity*, meaning a god. Each succeeding civilization, Egyptian, Persian, Greek, and Roman, worshipped the sun, and in this country the Druids at Stonehenge included sun-worship in their rites.

Four hundred years before Christ, Hippocrates, the father of medicine, practised sun cures on the little Greek island of Cos, and aristocratic Greeks and Romans built "solaria," or sun-balconies, on their country villas.

With the advent of Christianity, however, any practice savouring of paganism seems to have been swept away. Heliotherapy or sun treatment completely lapsed in the Middle Ages and there seems to have been no revival until near the end of the nineteenth century. Its importance was certainly overlooked in our own country, especially during the industrial revolution. Towns sprang up haphazard, and the wasteful use of coal still causes a pall of smoke to hang over our cities and industrial areas. The window-tax —only repealed in 1851—was directly responsible, excluding the sunlight by causing people to build fewer windows and to ease the burden by bricking up some of those which were already in existence.

But the dawn of a new era was approaching. In 1666 Newton had shown that a ray of white sunlight, when passed through a prism of glass split up into a band of colours —called the spectrum—ranging from red at one extreme through orange, yellow, green, blue, and indigo, to violet at the other, just like a rainbow.

Later scientists discovered that as well as its *visible* rays the sun gave off *invisible* rays at either end of the spectrum. Those at the lower end were termed *infra-red*; those at the higher end, *ultra-violet*. Both were found to be far more extensive than the visible spectrum and were rightly suspected of some health-giving virtue.

Owing to the density of, and impurities in, the atmosphere, however, many of these rays do not reach us. Indeed, the amount reaching the crowded streets of our big manufacturing cities must be very small. Furthermore, in northern countries bright sunshine is so uncertain a quantity, that systematic light treatment, especially in the populous towns where it is most needed, would have remained an impossibility.

But in 1893 the genius of a Danish doctor, Niels Finsen, gave to the world the first artificial source of ultra-violet rays. In November, 1895, he began to treat his first patient by means of his electric carbon arc lamp. The case was one of long-standing lupus (tuberculosis) of the face, and in four months was completely cured.

Eight years later Finsen died at the early age of forty-three, but on the foundation laid by him great progress has since been made, and light treatment now holds an increasingly important place in preventative and remedial medicine.

In 1903 Dr. Rollier started work at Leysin, 5,000 feet up in the Alps in Switzerland. There the clear atmosphere, the light reflected from the snow, and the dependable climate permit of treatment by natural sunlight with excellent results amid stimulating surroundings.

In England, at Alton in Hampshire and at Hayling Island, advantage is taken of natural sunshine, but this is replaced in dull weather by artificial rays. Thus the treatment and dosage can be carried out to a system and can be continuous.

Since Finsen's epoch-making discovery much progress has been made. Modern *mercury-vapour*, *tungsten*, and other lamps are richer in ultra-violet rays than actual sunlight—as it reaches this earth—and are also poorer in certain other rays, which are not beneficial. Furthermore, the different types of lamp give off invisible rays in

different proportions, one type being more suitable than another for a particular treatment.

Effects of Light upon the Human Body.—*General Effects.*—It is not certain *how* the invisible rays act upon the body; it is only certain that they *do* act.

One theory is that the healing process is brought about through the nervous system; another, that the rays are absorbed by the blood. Whatever the explanation, the ultra-violet rays have a powerful action and all forms of animal life are stimulated by light treatment. Appetite, vitality, and general tone are improved, and most patients undergoing treatment experience a feeling of well-being.

Effect upon the skin.—Some hours after a mild exposure to natural or artificial ultra-violet rays the skin becomes slightly reddened. This condition—called "erythema"—is the first stage of sunburn and is graded into four degrees. In first degree of erythema there is no peeling, nor subsequent bronzing, of the skin. In erythema of the second, third, and fourth degrees there is respectively slight, marked, and complete peeling (with blistering) followed by bronzing, or colouring of the skin. This colouring action acts as a filter of the sun's rays. It is due to the formation of "melanin" in the deeper tissues of the skin and is Nature's way of protecting the body from too much exposure to light. Thus negroes, who possess this colouring to a marked degree, resist the tropical sun far better than do white-skinned people.

Effect upon the blood.—Here again there is as yet no definite knowledge. Most complaints of the circulation, such as anæmia, leukæmia, chilblains, and certain heart diseases respond well to radiation. In rickets calcium is deposited in the bones. Therefore it may be concluded that exposure to the ultra-violet rays increases most of the blood constituents and raises the calcium phosphate content. Also, by increasing the number of white corpuscles, radiation appears to increase to give the blood more power to destroy the germs.

Effects on germs.—In 1877 Downes and Blunt demonstrated for the first time that light has the power to kill germs. Thirteen years later Robert Koch exposed tubercle bacilli, spread on a glass slide in a thin film, to direct sunlight. They were killed in ten minutes. It seems, therefore, that in sunshine man flourishes and his enemies the microbes die, while in darkness the converse is true. It is now known that it is the ultra-violet rays, whether natural or artificially produced, that possess this power of killing germs.

Effect upon the eyes.—The eyes are extremely sensitive to artificial ultra-violet rays, and both patient and operator must wear special goggles, preferably of a well-tried make.

Indications for Light Treatment.—Light treatment, though still in its infancy, has become the recognized treatment for certain diseases and a useful help to treatment in many others.

Artificial ultra-violet rays must never be given except on medical advice and under medical instruction.

Great care must be taken with the early doses, as some people are much more sensitive than others. When it has been noted what exposure each case can tolerate and how the skin re-acts, increasingly larger doses are cautiously given. Very exact timing is necessary, and for this purpose special alarm clocks are obtainable which can be set to ring at the end of the desired exposure.

The following is a list of the principal conditions in which ultra-violet rays are used.

Tuberculosis.—For all forms of tuberculosis, *except* of the lungs (phthisis), ultra-violet rays, natural or artificial, are a very important treatment.

Diseases of the Circulation.—*Anæmia* (*chlorosis*).—Twice-weekly, general toning-up baths usually do much good, as the ultra-violet rays increase the blood constituents.

Leukæmia.—General twice-weekly baths are given with a lamp rich in infra-red rays.

Valvular disease of the heart.—With careful treatment such cases may do well. Stimulants should always be to hand and the pulse watched.

Chilblains (*pernio*).—Along with electrical treatment twice-weekly general body and local light treatment is given.

Varicose Veins.—These cases generally improve greatly.

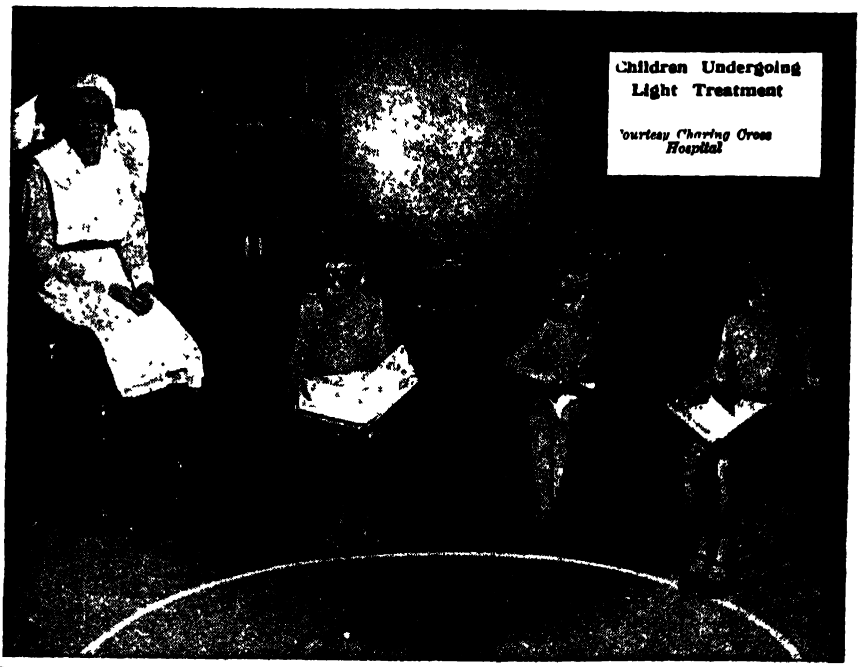
Disorders of the Digestive System.—*Dyspepsia*, *chronic gastritis*, *gastric* or *duodenal ulcer*.—Ultra-violet rays are often very successful in relieving these conditions.

especially when given together with medical treatment. Cases of chronic diarrhœa and nervous lack of control can be confidently treated.

Jaundice, especially if calcium salts are given by mouth, improves with this treatment.

Hæmorrhoids or *Piles* have been treated by ultra-violet rays with satisfactory results, but electrical treatment is probably better.

Pelvic disorders.—*Amenorrhœa* is often due to anæmia, in which case it readily responds to light treatment.



Children Undergoing Light Treatment

Courtesy Charing Cross Hospital

Dysmenorrhœa.—Light treatment, in conjunction with diathermy, is often ordered for this trouble.

Leucorrhœa and *Menorrhagia.*—Ultra-violet rays have helped both these disorders.

In all menstrual disorders exact medical instructions should be given by the doctor.

Nervous System.—*Infantile Paralysis, Locomotor Ataxy, Disseminated Sclerosis.*—Such organic diseases cannot, of course, be cured by ultra-violet rays, but light treatment is often helpful, together with other treatment.

Herpes.—Ultra-violet ray treatment is now considered the best for this condition. If taken in hand promptly, the illness is shortened, if not ended, and the pain and scarring reduced to a minimum.

Neuritis responds to general treatment with local light treatment of painful spots.

Sciatica.—Strong doses of ultra-violet rays are given, together with electrical and massage treatment.

Neurasthenia.—Cases of nervous exhaustion respond excellently to general tonic baths given twice weekly. After two or three doses the patient's whole outlook is brightened.

Neuralgia is quickly relieved by the soothing properties of the ultra-violet rays.

Nose, Mouth, and Throat.—*Acute Tonsillits* may be relieved by giving a strong dose, directly on to the affected tonsil at the beginnıng of an attack.

Hay Fever.—In this distressing complaint very successful results have been obtained from light treatment. As a rule, one week's treatment is sufficient. The first day each nostril receives 3 minutes' treatment, consisting of three one-minute exposures with the nasal applicator in three different positions. If there is no marked reaction, each exposure is increased next day and each succeeding day by 1 minute, so that on the

seventh day each nostril is exposed to the light for 21 minutes. The treatment should be repeated just before the time the disease used to re-appear.

Respiratory System.—*Asthma.*—Ultra-violet ray treatment is well worth trying for this baffling disease. Many cases have greatly benefited by it.

Bronchitis.—The general raising of the body's resistance to infection explains the improvement brought about by light treatment in cases of chronic bronchitis. The amount of phlegm in the throat is lessened, the cough becomes less troublesome, and thereby the sleep less disturbed.

Whooping Cough.—This disease benefits very much indeed by light treatment. The fits of coughing become rarer and milder. Children are less irritable, eat and sleep better, and gain weight.

Rheumatic Complaints.—Ultra-violet rays may be used to help other treatment of *rheumatism.*

Lumbago.—This condition improves rapidly with light treatment.

Rheumatoid Arthritis.—Chronic cases derive much relief from general or local light treatment combined with massage and manipulation.

Diseases of Nutrition.—*Rickets.*—Ultra-violet radiation is now an acknowledged treatment for this disease. There is improvement in sleep, colour, appetite, activity, and general fitness, probably due to an increase of calcium and phosphorus in the blood. The children gain height and weight, and marked improvement of the bony structures is shown by the X-rays.

Some authorities advise light baths for the expectant and nursing mothers, in view of the heavy calcium demand during this period.

Diseases of the Skin.—The powerful germ-killing action of the ultra-violet rays is used with excellent results in such diseases as *alopecia*, *eczema*, *erysipelas*, *impetigo*, and *ringworm.* Light treatment is also successful in treating septic wounds, ulcers, boils, and carbuncles. Its outstanding success in *lupus* has already been mentioned.

Ultra-violet Ray Treatment in Dentistry.—As light treatment helps to increase the power of the body to kill germs and increases the amount of calcium in the blood, the calcification of the teeth is thereby improved and the likelihood of dental decay is reduced. It is probable, therefore, that the ultra-violet rays will become increasingly important in dental practice.

Pyorrhœa Alveolaris.—Results seem to differ widely. Some observers claim rapid and permanent improvement, others have not been so successful. In any case the teeth must first be X-rayed and the infected ones located.

Gingivitis.—This is the name given to any condition of inflammation of the gums. Such a condition often yields to light treatment.

Diseases in which the Treatment should not be used.—Light treatment should *not be given* in the following cases.

Albinos.—Owing to the absence of melanin there is no protection against an overdose.

Inoperable Cancer.—Radiation stimulates growth.

Kidney Diseases.—Albumin in the urine is increased.

Weak Heart.—Very weak heart cases are not suitable subjects.

Pulmonary Tuberculosis.—Radiation is likely to induce hæmoptysis (spitting of blood) and increases the activity of the disease.

Radiant Heat.—So far we have been chiefly concerned with the properties of the ultra-violet rays, but the infra-red rays, occurring at the other end of the spectrum, are also used in medicine.

Ordinary glass, which does not allow the ultra-violet rays to pass, allows the infra-red, or heat rays, to pass. Special lamps are not, therefore, needed.

The treatment consists of local or general light baths with a number of incandescent electric lights. These are of suitable size and shape for different parts of the body.

The whole body can be treated in a wooden cabinet, in which the patient sits at a temperature of about 80° Centigrade (177° Fahr.), and profuse sweating is produced.

Indications for Radiant Heat.—Radiant heat to the trunk and limbs is valuable in all cases of poisoning in the system, such as the cases due to uræmia and the suppression of urine, puerperal eclampsia, etc.

General cabinet treatment is given for obesity, high blood-pressure, chronic intestinal poisoning, gout, rheumatoid arthritis, chronic nephritis (Bright's disease).

Local treatment is beneficial in sprains, synovitis, muscular rheumatism, and sciatica.

N.B.—Whatever form of light treatment is being given, the operator should never leave the patient alone.

X-Rays.—X-rays are used for the treatment of such parasitic diseases as ringworm and favus, and for destroying tumours. They are also used with ultra-violet rays in cases of stubborn ulcers and similar lesions, and in such skin diseases as acne and eczema, and to help to get rid of the scars left by boils and carbuncles.

LIGHTNING.—The effect of being struck by lightning is similar to that of receiving a severe electric shock. A person may be killed immediately or he may escape with his life; but be severely burned or paralysed. There is a case on record where a man was struck by lightning while crossing a field and every bit of his clothing was torn, even his boots, but he himself was quite unhurt and had no mark of any kind on his body. (*See* SPECIAL SUPPLEMENT ON FIRST AID, at the end of this book.)

LIME.—Lime is often referred to as calcium, and it is present in the body, especially in the bones and teeth. There is a small amount in the tissues and blood, but even this small amount is essential for the maintenance of life. Prepared chalk is used extensively as a dusting powder, and also for making up tooth powders. Slaked lime, or calcium hydroxide, has been used in the form of Vienna paste to destroy warts. Lime water mixed with olive oil or linseed oil is known as Carron oil, and it is greatly used in the treatment of burns. Lime water is also given to infants along with their bottle as it makes the milk more digestible. (*See also* CALCIUM.)

LINCTUS.—Any thick syrupy medicine which has to be licked off the spoon is described as a linctus. Most of these medicines have honey or treacle as a basis and they are generally given as cough mixtures.

LINIMENT.—Liniments, or embrocations, are preparations intended for application to the skin by rubbing. They are usually of an oily nature, which enables them to be absorbed, thus helping to remove pain and stiffness. The most important liniments for relieving pain are made up with aconite, belladonna and chloroform. When mixed together in equal parts, this is known as A.B.C. liniment, and it is a very popular mixture for neuralgia, rheumatism, etc. Iodine liniment is applied to swollen joints, and opium liniment may be used to relieve various painful conditions. Liniment of ammonia, more popularly known as oil of hartshorn, is also good for painful conditions, and turpentine and the acetic liniment of turpentine, along with camphor, croton oil, ammoniated camphor, soap, are all excellent liniments for stimulating the skin.

Liniments should be rubbed in very thoroughly, as much of their beneficial action depends on this. Care must be taken, however, never to use a strong liniment on a very tender skin, and at the first sign of blistering the rubbing must be stopped, otherwise a very disagreeable amount of irritation may be set up. A liniment should never be rubbed in on any part of the body where the skin is broken. Soothing liniments, for the relief of inflamed parts such as occurs in burns, etc., may be applied and covered with a piece of lint, or the lint may be soaked in the liniment and covered with a piece of oiled silk. As a rule, liniments contain highly poisonous substances and are dispensed in green or blue bottles; but nevertheless, it is advisable to keep these preparations apart from the ordinary medicines, especially if there are children who can gain access to the medicine chest.

LINSEED.—The seeds of the common flax give us an oil known as linseed oil which is useful in the treatment of burns. The whole seeds are used for making an infusion of tea, which is given to relieve sore throat and bronchial catarrh. Usually liquorice or honey is added to relieve the cough which generally accompanies a sore throat. Linseed tea is also good for relieving inflammation of the kidneys or bladder. A linseed poultice may be applied to relieve pain, but the poultices should be smeared with oil to prevent their sticking to the skin. A mixture of equal parts of linseed oil and lime water forms carron oil, which is a favourite treatment for burns.

LINT.—Lint is made from linen cloth which has been scraped on one side so that one side presents a fluffy appearance while the other is smooth. When applied to wounds, the smooth surface should always be next to the skin as it is less likely to stick. Boracic lint is most commonly used for dressing cuts or sores of any sort, and it should be wrung

out of some antiseptic lotion or hot water before it is applied. Lint is also a useful way of applying ointments to the skin, and here again, the smooth side should be undermost.

LIPOMA.—Lipoma is the name given to tumours which are largely composed of fat. These tumours may be found in any part of the body, but they seldom give rise to any trouble beyond that connected with their size and position. (*See also* TUMOURS.)

LIPS, DISEASE OF.—Cheilitis glandularis, or inflammation of the red lips, is not a very common disease, but most troublesome when it occurs. The lower lip is the one chiefly affected, but both are involved. The mucous glands swell, and form small blisters, which vary in size from a pin-head to a sago-grain. When pricked they discharge mucus, or a mixture of mucus and pus. In the latter case, especially, the lips become much thickened and tend to turn out, producing much disfigurement.

The disease is due to various causes. Sometimes, not very commonly, it seems to spread from a skin disease on the face, as in dermatitis of the upper lip due to chronic nasal catarrh; sometimes chronic pyorrhœa (q.v.) will cause it; and sometimes a dentifrice, generally containing carbolic acid or salol, and which happens not to suit that particular person, produces a preliminary irritation which merges into the disease.

Treatment.—In these obvious cases the treatment is simplified, but in other cases the cause cannot be found, and the local condition alone can be treated. Some recommend potassium iodide internally, frequent gargling with potassium chlorate, and a *mild* cauterizing of the lips with silver nitrate or the thermo-cautery. It is generally found, however, that cheilitis is most rebellious to treatment, and none but the most active and persistent measures seem to do any good. The most successful method, so far, appears to be to apply pure carbolic acid, twice weekly, to the lips, taking care not to allow the acid to touch other parts. This application should, of course, be made only by the doctor in charge of the case.

LIQUOR AMNII.—More commonly known as "the waters," liquor amnii is the fluid which surrounds the child in the womb. The average amount of this fluid is about a quart, and it serves to protect the child from injury. (*See also* LABOUR.)

LIQUORICE.—Liquorice is obtained from the root and underground stem of a plant which is grown extensively along the shores of the Mediterranean and which is cultivated in Great Britain. Liquorice powder is a popular laxative, and it is very suitable for children or for women during pregnancy. Liquorice also disguises the taste of other preparations, especially that of aloes, cascara, Epsom salts, and other bitter substances. It is very soothing for cases of sore throat, and many sweets are made containing liquorice which are useful for stopping a cough.

LITHÆMIA.—A condition in which, owing to faulty working of the system, the body becomes charged with substances, principally of the uric-acid group. This may be due to over-eating or a lack of fresh air and exercise. As a rule, an attack of gout or rheumatism will result owing to the excess of uric acid in the system.

Treatment.—Treatment consists in regulating the diet and avoiding too much meat. Plenty of vegetables and fresh fruit should be taken, and water should be taken freely. A certain amount of exercise should be taken daily and as much fresh air as possible.

LITHIASIS.—The formation of stones in any part of the body is described generally as lithiasis. (*See also* CALCULI; GALL STONE.)

LITHIUM.—The salts of lithium, which is a soft, silver-white metal, used to have a great reputation for getting rid of uric acid and chalk-stones and other deposits from the system, but it is doubtful whether there is any justification for the medicinal use of these salts. It is believed that their beneficial action may be due to the large quantities of water in which they are taken.

LITHOTOMY.—The operation known as lithotomy literally means cutting for stone. This operation is one of the oldest in medical history, and it appears that stone in the bladder must have been a very common condition a few centuries ago.

LITMUS.—Litmus is a blue vegetable dye which is obtained from various species of lichen, and it is employed for determining the presence of acids and alkalies. Litmus paper when steeped in an alkaline solution becomes blue, and when in contact with acid fluids, becomes red.

LIVER.—The liver is the largest gland in the body, weighing somewhere around three

and a half pounds, and measuring about twelve inches from side to side and six inches at its thickest part. It lies on the right side of the abdominal cavity and is dark-brown in colour and solid to the touch. The upper part, which is rounded in shape, fits in and fills up the cavity of the diaphragm, and its weight is supported by the other organs in the abdomen upon which it rests. The liver is looked upon as the great storehouse of the body and many chemical substances are dealt with and given off when the occasion arises. For example, when an increase of energy is required, the liver gets busy and manufactures energy-giving substances out of the digested food, especially sugary or starchy foods. But if the diet is excessive or ill-balanced, the storage power of the liver may become over-taxed, especially if no exercise is taken to allow the liver to use up the extra sugar, etc. The liver also manufactures bile, which is an important substance in aiding digestion. Disturbance of the workings of the bile ducts causes the condition known as jaundice, which is dealt with under its own heading. (*See also* CIRRHOSIS OF THE LIVER; DIGLSTION; GALL-BLADDER.)

LIVER FLUKE.—A parasitic flat worm which infests the bile ducts and liver of sheep and is responsible for the disease known as sheep rot. Occasionally these liver flukes are found in man.

LIVERISH FEELING.—A state of depression, which may be accompanied by headache, is very often the result of over-feeding or over-drinking. The patient usually loses all interest in life, and the complexion may turn dull and yellow. The digestion is disturbed and there is a marked loss of appetite. The symptoms are never severe, but they may be unpleasant for a day or two.

Treatment.—A good dose of salts first thing in the morning and plenty of fresh air and exercise will do much to get rid of the depressed feeling.

LOBE.—A rounded part of an organ which is subdivided from the neighbouring parts is termed a lobe, such as the lobes of the liver or of the brain. Lobar pneumonia is a disease which affects the subdivisions or lobes of the lungs. The lowest part of the ear which is soft and rounded is known as the lobe or lobule of the ear.

LOCHIA.—The discharge which takes place from the womb during the first week or two after childbirth is known as lochia. During the first four days the discharge is usually composed of blood. On the fifth day it becomes brownish in colour, and later it changes until it becomes almost whitish in appearance. If the red blood continues for any length of time or if there is any putrid odour connected with the discharge, medical advice should be sought as there may be some disorder of the womb. (*See also* LABOUR.)

LOCKJAW.—Lockjaw is the popular name for tetanus, which is a serious disease caused by infection due to contamination by soil or dust. (*See also* TETANUS.)

LOCOMOTOR ATAXIA.—Is a chronic disease of the nervous system which is one of the late results of syphilis. It is found in men at least ten times as commonly as in women, and the symptoms may first appear as long as twenty years after the infection has been taken.

Symptoms.—The disease is due to destruction of the conducting paths in the spinal cord which carry certain forms of sensation to the brain from the nerves in the limbs. Consequently one of the features of the disorder is a loss of the sense of position in space. If a person with locomotor ataxia is asked to stand with his feet together and is then asked to shut his eyes, he sways from one side to the other, and may even fall, because no impressions as to where his feet are will reach his brain and so he cannot keep his balance without using his sense of sight. Similarly, if asked to point with his index finger to his nose, keeping his eyes shut, he will be unable to do so, but aided by his eyesight, he can do this perfectly. Changes in the coverings of the spinal cord (the meninges) produce pains, the character of which is peculiar to the disease.

These are called "lightning" pains, and they occur in bouts. They are felt as short stabs, rather as if red-hot needles were being pushed into the skin, through the limbs, not along them. These pains move about; at one time they are felt in the legs, at another time in the arms or in the back, but their character remains the same. They are especially liable to be felt at any spot where a bone comes to the surface, as at the ankle or wrist. This symptom of "lightning" pains may be present for many years before

any other symptoms are complained of. In fact, it is not out of place to say here that locomotor ataxia, though it used to be a very severe, crippling, and in the end fatal disease, has now, through modern methods of treatment, so altered its nature that twenty or more years may pass before a patient with this disorder suffers any more inconvenience from his trouble than occasional bouts of these pains. It may also be noted that the disease runs a very mild course in women, and the old idea of a patient with locomotor ataxia staggering all over the place must be abandoned in the light of modern experience.

But much depends on the early treatment of the disease, and a patient in early middle life who suffers from what he thinks are bouts of "rheumatic" pains should at all events be examined to make sure that his pains are not the "lightning" pains of locomotor ata. ia. By the time that pains are felt, certain signs are already present, such as changes in the normal reaction of the pupils of the eyes to light, which will enable the disease to be recognized. If it is not recognized in this stage, sooner or later unsteadiness in walking will appear, the patient noticing that this unsteadiness is greater in the dark. He will also notice that he is apt to stagger when his eyes are covered, as when he washes his face. Sometimes, other pains are felt. These may be termed "lightning" pains in the different organs of the body, and are commonly called "crises," because whilst they are felt they are so severe that often they have led to surgery being called for as the condition of the patient is so alarming that he is thought to have some acute stomach trouble demanding immediate operation.

The commonest of these "crises" is the stomach crisis. Every few weeks for months on end, the patient has attacks of intense pain and sickness, which for a time are bad enough to stop him working. These attacks last for a few days to a week, and then during the intervals between attacks, he has no pain or sickness whatever. There is also a crisis of the throat, in which the patient gets a spasm of the muscles of the throat accompanied by a barking, or crowing cough, somewhat resembling whooping cough. These two are the commonest "crises," but there may be severe attacks of pain in the back passage, again occurring in bouts with intervals of freedom from pain. One other symptom which may arise quite early in the course of the disease is a mistiness of vision. This is rather serious, as it is due to a destruction of the nerve paths in the nerve of sight itself, and though much can be done in the way of treatment, vision is never fully recovered. Sometimes a squint appears or the patient sees two things instead of one for a little while, but these symptoms often clear up of their own accord. Ulcers may appear on the soles of the feet, but only late in the disease.

Treatment.—The treatment of locomotor ataxia is important, as by modern methods the disease can be so arrested that the stage at which a patient staggers about and is stiff in his legs when walking, is never reached. As a rule, the later the disease comes on, the better the outlook, whatever form of treatment is carried out. The course of the disease is much slower when it begins in people of from 50-55 years of age than when it attacks those of from 35-45; but the main thing is to have the trouble recognized early, so that the right treatment can be given. The usual treatment of the general disorder consists in a course of injections with arsenic, which have a remarkable effect on the cause of the disease. After a course of injections further treatment with medicine for a long time is necessary and another course of injections may be given after the medicine. The injections are usually given weekly and, unless there is any special reason to the contrary in any particular case, there is no need for the patient who is having these injections to give up work and stay in bed. General tonics also help to keep these patients healthy, for it has been noticed that patients with locomotor ataxia particularly need to be kept "up to par," for if they get such mild infections as colds or bronchitis, the disease seems to progress more quickly. But in those patients who come under observation late in the course of the disorder, their most distressing symptom is their difficulty in walking straight. Certain exercises have been devised by Frenkel to help these people to re-educate their muscles, so to speak. It has already been shown that the difficulty in walking straight is due to the fact that when a patient cannot see his limbs he is unable to tell in what position

they are. Frenkel's exercises consist mainly in improving the use of those nerve paths and fibres which are undamaged by the disease. The patient is taught to move his limbs quite accurately. For instance, he may be put on a couch and made to move his feet from square to square on a big wooden frame so that the heel is correctly placed on various marked spots, or he may be made to walk to a certain pattern laid out on the floor. These exercises not only make the best use of what undamaged nervous tissue is left, but what is even more important, they give the patient confidence in himself. (*See also* SYPHILIS.)

LOGWOOD.—Logwood, or hæmatoxylon, is obtained from a tree which grows in the West Indies. It is used in medicine because of its astringent (drawing together) action and it is given in the treatment of diarrhœa. It contains a colouring matter which is used for staining purposes in microscopical work.

LOIN.—The loin is the part of the back which lies between the last rib and the top of the pelvis. Pain is felt in this part of the body during an attack of lumbago and in some forms of backache.

LONG SIGHT.—Medically known as hypermetropia, this condition is discussed under that heading.

LORDOSIS.—When the spine is unnaturally curved forward the condition is known as lordosis. This condition may be due to some weakness of the back caused by disease, and it is present in a slight degree during pregnancy. (*See also* SPINAL CURVATURE.)

LOTION.—Preparations which are used on the skin or for bathing wounds, etc., are known as lotions. The drugs are usually mixed with water or alcohol, and those of an oily nature are known as liniments. The most important type of lotion is the antiseptic one which may be made up from various drugs. Solutions of boracic acid or carbolic acid are very commonly used. Picric acid lotion is much used for burns or other sores which require drying up. Lotions containing zinc or calamine are excellent for bathing all sorts of raw surfaces and ulcers, and it is a good application for many varieties of eczema and other skin diseases. Astringent lotions which draw the tissues together are much used nowadays in beauty preparations.

The best way to apply antiseptic lotions is to use a piece of lint. The lint should be wrung out of the lotion and applied with the smooth side next to the skin; and in order to prevent the antiseptic lotion from evaporating, the lint should be covered with a piece of oiled silk and a wad of cotton wool and the whole kept in place with a bandage or sticking plaster. Lotions which are used to cleanse wounds, such as hydrogen peroxide, etc., should be gently squeezed over the parts by means of cotton wool or lint. Gentle wiping with the lint or cotton wool dipped in the lotion is excellent for removing clots of blood or pus from a wound. Soothing lotions and cooling lotions are applied to inflamed and irritated parts and it is best to use a piece of lint for the purpose. A very soothing eye lotion is made from boracic acid and it should be applied by means of a proper eye-bath. (*See also* BORACIC ACID; EYE BATH.)

LOUSE.—*See* HEAD LOUSE.

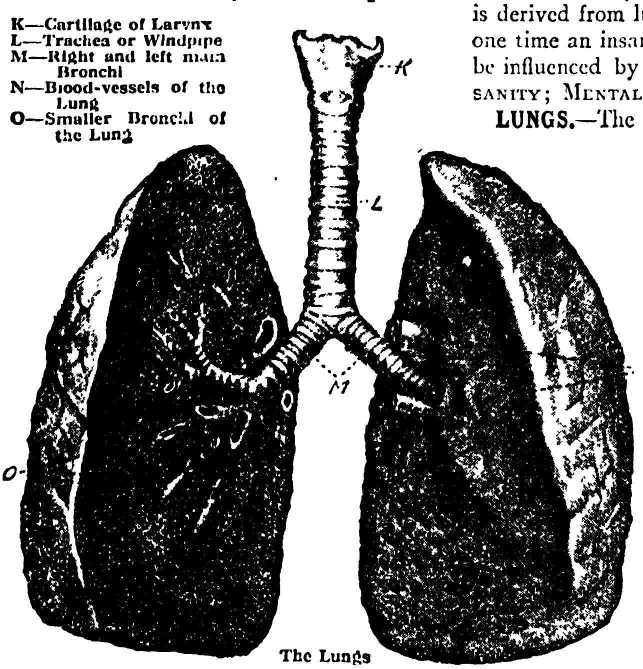
LOZENGE.—Lozenges are also known as troches and they are solid tablets containing drugs mixed with sugar and gum and flavoured with some sort of fruit-paste such as blackcurrant. They are greatly used in the treatment of affections of the mouth and throat, and as they are gently sucked the drug which they contain comes in contact with the affected parts. This method of treatment is especially good for children as it is very difficult for them to gargle properly. Some of the substances most commonly used in lozenges for this purpose are benzoic and tannic acids, potassium chlorate, eucalyptus, menthol and carbolic acid. Lozenges made up with bicarbonate of soda and peppermint are convenient for carrying about in cases of indigestion.

LUMBAGO.—In this affection, pain and stiffness are felt in the muscles of the small of the back. Men are more liable to attacks than women, and the condition may be brought on by exposure to wet and cold. Any bending or turning may be extremely painful; in fact, some patients may find that to sneeze or cough is a very disastrous experience. Lumbago may also be caused by strain or injury or it may be associated with rheumatism.

Treatment.—If the pain is at all severe, the patient should remain in bed and be kept as warm as possible with hot water bottles placed near the back. Massage or vigorous rubbing with a liniment will help to relieve

the pain. Turkish baths are good in slight cases, and aspirin tablets, not more than two at a time, will be found very soothing. The bowels should be kept open with suitable medicine. (*See also* RHEUMATISM.)

LUMBAR REGION.—The part of the body which is most commonly called the small of the back is medically known as the lumbar region. The framework consists of the lumbar vertebræ or bones of the spine which are covered by several important



The Lungs

muscles. The organs of the body which lie in the lumbar region are the kidneys, the ascending colon in the right loin and the descending colon in the left loin. The muscle in the small of the back which serves to keep the spine erect, is a very common site for strain which may lead to lumbago. Lumbar abscess is almost always caused by tuberculosis of the spine, which usually results in a softening of the bones or vertebræ. Lumbar puncture is an operation carried out for the purpose of obtaining a sample of the cerebrospinal fluid from the spinal canal. A hollow needle is inserted between two of the bony vertebræ and the fluid is withdrawn. By this means valuable aid may be gained in the diagnosis and treatment of obscure conditions, e.g. general paralysis of the insane.

LUMINAL.—A soothing drug which is very closely allied to veronal. Luminal sodium is used a great deal in the treatment of epilepsy and in other conditions where a quietening effect is required. (*See also* EPILEPSY.)

LUNAR CAUSTIC.—This is another name for nitrate of silver. It gets the name from lunaris, which means moon-like, silver being a moon-like metal.

LUNATIC.—This term is applied to people who are mentally unsound. The name lunatic is derived from luna, the moon, because at one time an insane person was supposed to be influenced by the moon. (*See also* INSANITY; MENTAL DISEASE.)

LUNGS.—The lungs are structures which are among the most essential to life in the body. There is a left lung and a right lung, situated in the thorax with the heart between them, and they are protected by the ribs. The function of the lungs is breathing or respiration, which means the interchange of the gases of the body with the gases of the atmosphere in which the body lives. Air passes down the throat to the trachea or windpipe into the lungs, along the tubes called bronchi; these divide and subdivide into little bronchioles, the smallest of which are tiny little tubes less than a hundredth of an inch wide, and ending in little air sacs called "alveoli;" these alveoli are made of a delicate membrane covered by blood capillaries (the smallest blood-vessels) and so delicate are the microscopic walls of the alveoli and the capillaries that the blood can take up oxygen from the air in the alveoli and the air can take up carbonic acid gas and other impurities from the blood.

The lungs have a special blood circulation of their own, quite distinct from the circulation of the blood in the other parts of the body. From the right ventricle of the heart goes the pulmonary artery, filled with dark venous blood, and divides into two

parts, one of which goes to each lung. The blood goes all over the lung in smaller and smaller blood-vessels, until it is in the microscopically small ones called capillaries; then occurs the exchange of gases with the air, as has been described.

The right lung is in three divisions, or lobes, and the left one (which is smaller, because of the heart being more on the left side) in two lobes. Both lungs are covered with a delicate moist membrane, the pleura, and the cavity in which they lie is also covered with a similar membrane, so that when the lung expands or contracts it moves freely within this cavity.

Diseases of the Lungs.—Inflammation of the lung itself, which is caused by two or three different kinds of germs, is called *pneumonia*; inflammation of the lining of the lung is called *pleurisy*; *bronchitis* is inflammation of the lining of the air tubes or bronchi; *broncho-pneumonia* is a kind of pneumonia which has spread from a bronchitis and is of a more "patchy" type than a *lobar* pneumonia, which is an inflammation of the lung tissue affecting a whole lobe or more than one lobe; *bronchiectasis* is a chronic abscess cavity, usually at the base of a lung, which has developed in a bronchial tube—it is said to be often due to inhalation of some foreign body into the lung.

LUPUS (Tuberculosis of the skin).—Tuberculosis may attack the skin in various ways, producing several distinct varieties of the disease.

Lupus vulgaris is the most common type. It is characterized by reddish-brown patches, composed of tiny nodules (called "apple-jelly" from their appearance) embedded in inflamed skin. The disease is destructive, causing ulceration and scarring. It tends to heal at one place and spread at another.

It usually begins in childhood, especially on the face and neck. These are probably infected with dirty hands coming into contact with animal tuberculosis. In cleanly people, the disease may remain at this simple stage for years, only very slowly spreading. In the great majority of cases, however, the patches become infected with other organisms, and a crusted discharging eruption results.

Later, ulceration takes place, with underlying infection of the lymph-glands, bones, and other parts. The ulcers are irregular, deep, and do not heal. The nose and the lobes of the ears are commonly attacked by the disease and gradually "nibbled away." The tip of the nose may be beak-like, or in bad cases the whole of the soft parts destroyed. The upper lip becomes swollen, thickened, and ulcerated. On the hands and feet, and about the genitals, deformities are likewise caused. The mucous membranes are also attacked in very many cases.

This type, when neglected, produces the most terrible disfigurement. It is supposed that many cases of "leprosy" of the Middle Ages were in reality lupus. Nowadays, badly disfigured patients are comparatively seldom seen.

Fibroid and *warty lupus* are also common varieties, and their appearance is very similar. In both there is a hard overgrowth of tissue, with few nodules, occurring especially on the limbs and buttocks.

Post-mortem warts occur on the hands of butchers, doctors, and nurses. They show the reaction of healthy tissues to the infection. A wart may persist for years unchanged, is generally easily cured, and in some cases disappears of itself.

Lupus cancer is an occasional and very serious complication of simple lupus. It is caused by the prolonged use of X-rays in treatment. Its appearance and treatment is as that of cancer of the skin (q.v.).

The general *outlook* of lupus is exactly the same as that of tuberculosis of other parts. Where the patient lives a healthy, cleanly life and perseveres with treatment, which must necessarily be prolonged, he has an excellent chance of cure, though some scarring will remain.

Treatment.—Preliminary treatment varies somewhat in the different varieties. Crusted discharging ulcers are scraped with a "sharp spoon," followed by the constant use of an antiseptic ointment. Fibroid lupus is removed by blistering fluid and other caustics. Warty lupus is treated as warts (q.v.). After this, the aim of treatment is to destroy the tubercle organism. This is done by surgical removal, which must be thorough; or by burning with strong caustics, which, though effective, are painful and cause unsightly scars; or by milder caustics.

Ultra-violet ray treatment by "sunlight lamps," the Finsen and Kromayer light methods, and radium and carbon dioxide

snow for small areas, are all excellent, the first especially so. Tuberculin ointment is also used. X-rays are now seldom employed owing to the risk of cancer.

Internal treatment is the same as that for tuberculosis generally; the patient is given cod-liver oil, necessary tonics, and careful directions as to his general mode of life.

LYMPH.—The fluid which circulates through the lymphatic vessels of the body is known as lymph. This fluid is the watery portion of the blood which is filtered through the walls of the capillaries. The term lymph is also used to describe the serum obtained from the blood of calves which is used for vaccination. (*See also* Ductless Glands; Serum; Vaccination.)

LYMPHATIC SYSTEM.—The *lymph* is a clear fluid, derived from the blood, which nourishes the cells of the body and collects waste products from them. It circulates in the little chinks between the microscopic cells which build up the different structures of the body, and these unite to form tiny vessels, which in turn unite to form larger vessels rather like small veins and, like them, have valves which prevent any back-flow. The lymph vessels pass through groups of lymph glands in different parts of the body, which act as filters to the lymph circulation, and keep back germs and impurities from getting into the blood-stream. Eventually the lymph vessels unite into larger vessels which discharge the lymph into the jugular veins at the root of the neck. Besides acting as filters the lymph glands give rise to lymph cells which form part of the corpuscles of the blood. The *thoracic duct* is the largest lymph vessel in the body, which collects, in addition to lymph from the limbs and chest, the digested fluids absorbed from the stomach and intestines.

LYSIS.—This means the gradual ending of a disease, especially of a fever. This gradual decline is very typical in enteric fever or typhoid, the temperature falling a little each day until it reaches normal. The opposite of lysis is crisis, in which there is a sudden ending of the disease, and the temperature may return to normal within a few hours.

LYSOL.—Lysol is obtained from coal-tar and it is a powerful antiseptic. It is very popular as it does not tarnish instruments, and it is also much used in domestic work. It mixes well with water and forms a good soapy lather. Lotions made up with lysol are used for cleansing the skin or for vaginal douches. The usual strength is about a teaspoonful of lysol to a pint of warm water, but stronger solutions may be used if necessary. It is excellent for washing wounds or sores and can be used externally as an antiseptic whenever required. It should never be applied to the eyes or taken internally. Should lysol be swallowed accidentally, the stomach should be washed out by a doctor and then white of egg or olive-oil should be administered as an antidote. (*See* Cresol.)

McBURNEY'S POINT.—This is a spot on the abdominal wall midway between the navel and the point of the haunch-bone. In appendicitis the point of tenderness lies directly underneath McBurney's point when pressure is made on the lower part of the abdomen on the right side. (*See also* Appendicitis.)

MACULA.—A term meaning a spot. A freckle, port-wine stain or any such spot may be called a macula. The *macula lutea* is the yellow spot of the eye. (*See also* Birthmarks; Eye; Freckle.)

MADNESS.—The word madness is loosely applied to any form of unreasonable conduct, but it used to be the medical term for what we now call insanity. Asylums for the insane were called madhouses but are now referred to as mental hospitals. (*See also* Hydrophobia; Insanity; Mental Disease.)

MADURA FOOT.—Madura foot or fungus foot is a tropical disease, found in India and other hot countries, in which the foot swells and cracks form in it which discharge matter containing little black or white granules, which are really a species of fungus. The fungus probably gains an entrance into the foot through a sore or scratch.

MAGNESIUM.—Magnesium is a silvery white metal which burns with a brilliant flame and is thus able to be used for flashlight photography indoors. In medicine its

various compounds are extensively used. Magnesium sulphate is the popular and powerful purgative known as *Epsom Salts.* Magnesium oxide, which is commonly called magnesia, is very useful in cases of stomach trouble where there is too much acidity. Milk of magnesia and magnesia cream are pleasant ways of taking it. A very favourite and useful mixture is the mixture of magnesium sulphate and magnesium carbonate called mistura alba or *white mixture.* Magnesium citrate or effervescing citrate of magnesia forms a very pleasant and cooling summer drink.

MAGNET.—Magnets are used in surgery to withdraw steel or iron splinters from wounds. They are especially useful for foreign bodies in the eye where they could not easily be reached without risk of damaging delicate tissues.

MALAISE.—By malaise is meant a feeling of illness or physical discomfort. Most illnesses are heralded by a day or two of malaise before the acute stage is reached. (*See also* MIGRAINE.)

MALAR.—The malar bone is the cheek bone. (*See also* BONE.)

MALARIA.—Malaria is a very common disease which is now largely confined to tropical regions, although a century or two ago it was apparently quite common in Britain under the name of *ague.* It is also known as marsh fever, jungle fever, or just "fever." In this country it is contracted only in a very few cases, but there are many people who have acquired the disease abroad and are still subject to attacks of it.

Malaria is a recurrent disease and is commonly divided into three groups according to the periods at which the bouts of fever return. (1) *Quotidian,* or daily; (2) *tertian,* or recurring every three days; and (3) *quartan,* recurring every fourth day.

History of Malaria.—Malaria is a very ancient disease in the world's history, but until comparatively recently it was not known how it was caused or transferred from person to person. In 1880 a French scientist, Laveran, was able to show that there was a parasite which was always found in the blood of patients with malaria. Later on, in 1894, the late Sir Patrick Manson and the late Sir Ronald Ross were able to prove that the same parasite could be found in the blood of a certain group of mosquitoes called the *anopheles.* From this they worked out that the anophele mosquito in the act of biting a person transferred the disease to that person. Similarly, by biting a person who has already contracted malaria the anophele mosquito can acquire the disease, and may later on bite a healthy person and give him malaria. After the parasite has been conveyed into the blood of a healthy person by the bite of the mosquito it grows and eventually splits up into a host of little bodies or off-springs, and at this point the attack of malaria begins. This explains the different periodicity of the disease, because some parasites take only one day, some three and some four to hatch out a brood and let them loose in the bloodstream of the bitten person.

Symptoms.—A typical attack of malaria is divisible into three stages. The first stage is one of shivering and general malaise. The patient feels tired with aching head and limbs and a cold feeling with bouts of shivering. He may describe himself as "chilled to the bone," and his teeth may chatter uncontrollably. This stage is short, lasting only an hour. The second stage is the hot and feverish stage. The temperature rises very suddenly to great heights and the pulse and breathing become rapid. The aches continue and there is great restlessness and often delirium. Vomiting and diarrhœa are common. This stage lasts several hours and the patient's condition becomes more and more uncomfortable until the third stage, or stage of sweating, is reached. This stage is in the nature of a crisis. Sweating is profuse, the temperature comes down rapidly and the patient becomes much more comfortable. The trouble is not over, however, because unless it is energetically treated the attack will return in exactly the same way, after one, three or four days, according to the type, and each attack will leave the patient weaker.

Treatment.—Malaria is one of the diseases for which there is a very definite line of treatment and for which a drug is specific —that is, particularly curative for that disease. This drug is *quinine.* Quinine is so generally used for malaria that no household in tropical countries would dream of being without it. Before giving the initial dose of quinine, however, it is best to give a large dose of calomel followed by salts. This is

important. During an attack of malaria as much as 30 grains of quinine sulphate should be taken daily, except in the case of a pregnant woman, who should take it in smaller doses at shorter intervals. It is as well to continue a daily dose of 10 grains for three or four months after an attack of malaria, and some people take a small dose such as five grains as a daily routine while they are in a malaria-infested neighbourhood, or if they have been exposed to the infection. While for three hundred years the treatment of malaria could be summed up in the word quinine, quite recently other effective drugs have been introduced, namely, *plasmoquine* and *atebrin*. Plasmoquine has a remarkable effect on certain types of malarial infection and has cured cases of benign tertian malaria resistant to quinine, but it does not prevent relapses in subtertian infections; it has been used most effectively in combination with quinine. Atebrin is the newest drug for the treatment of malaria and is very successful in subtertian and quartan infections and in the very serious type of infection called blackwater fever. Although the perfect anti-malarial remedy has not yet been discovered, atebrin is a very marked step in the progress towards it.

Wise persons will take precautions against contracting malaria if their lives should bring them into tropical regions. These precautionary measures include excluding mosquitoes from dwellings by the use of fine mesh wire gauze over windows and doors, and netting round beds. Gloves and high boots should be worn by those who are out at nightfall when the mosquito is about and at its busiest. Strong smelling oils such as oil of lavender and citronella may be freely sprinkled over the clothing, or mixed with the face powder, etc. (*See also* MOSQUITO; QUININE.)

MALE FERN.—The oily extract of the root of male fern (*filix mas*) is the chief remedy for destroying tapeworms. (*See also* FERN; TAPEWORM.)

MALIGNANT.—By malignant is meant dangerous to life. A malignant growth usually means a cancer. The opposite of malignant in medicine is benign. Malignant types of fevers, such as scarlet fevers, are spoken of when the patient becomes dangerously ill in a few hours and dies. Malignant pustule is a name for anthrax.

MALINGERING.—Malingering is a deliberate attempt to appear to have a disease or disability for the purpose of evading a duty or gaining some financial or other advantage. Hysteria and hypochondriasis are not intentional malingering, and in every case where malingering is suspected it is absolutely essential to make sure that there really is no physical disease of an obscure nature or a diseased mental state before pronouncing the verdict of malingering.

MALNUTRITION.—Malnutrition is the state of being undernourished owing to insufficiency of food, the wrong sort of food or some constitutional reason which prevents the food eaten from being turned into the requisite nourishment for the body.

MALT.—Malt is obtained from barley which has been allowed to sprout and has then been heated in a kiln to prevent further growth. It contains a ferment or digestive substance called *diastase* which works on starch and turns it into malt sugar. In the form of extract of malt it is a valuable aid to a weak digestion, and is also nourishing and strengthening because of the malt sugar (maltose) it contains. It is therefore often prescribed for people suffering from wasting and weakening diseases. It mixes well with other substances and can, therefore, be made a useful means of taking cod-liver oil, iron, etc. For commercial purposes malt is chiefly useful for beer-making. By adding yeast to malt, alcohol is formed, and with the addition of hops, beer is manufactured.

MALTA or UNDULANT FEVER.—Malta fever, which is also called undulant fever or Rock fever, is a very common complaint around the Mediterranean Sea and in other warm countries where goats' milk is used. It is thought that there may be occasional cases of it in this country too. In Malta, where it is a serious problem, the Government takes important steps to deal with it.

Malta fever is due to a germ called the micrococcus melitensis, and it is believed to be spread through the medium of goats' milk.

Symptoms.—The illness is not a very severe one, although it may continue in a long drawn-out form over even a period of years and wear the patient out. There is loss of appetite, headache, sleeplessness, and slight fever; in the evenings neuralgic pains and swellings in the joints appear. The

patient may become very much emaciated and exhausted.

Treatment.—Unlike malaria there is no absolutely effective treatment for this fever. The feverishness may be relieved by cold sponging if the temperature is very high. The patient must be kept on light diet with plenty of milk. When convalescent, tonics should be taken to build up the strength.

MANDIBLE.—The lower jaw is called the mandible. (*See also* JAW.)

MANGANESE.—Manganese is a metal whose properties resemble those of iron. In medicine it is chiefly used in the form of potassium permanganate. Potassium permanganate takes the form of purple crystals which are very easily dissolved in water, forming a solution ranging from light pink to deep purple, according to the amount used. It is a powerful antiseptic, disinfectant and deodorant. Taken internally it is used as an intestinal disinfectant and it is also a favourite solution for washing out the stomach or intestines. Solutions are also used for mouth or nose washing, especially in conditions where a deodorant is required. It may be used for vaginal douching and as an injection in gonorrhœa. Condy's fluid is an easily obtainable form in which to use permanganate.

MANIA.—Insanity in which the patient becomes dangerously excited is called mania. (*See also* INSANITY; MEGALOMANIA; MENTAL DISEASE; MONOMANIA.)

MARASMUS.—Wasting in a small child is called marasmus. (*See also* WASTING.)

MARMITE.—Marmite is a proprietary preparation which contains yeast and is a useful way of supplying the vitamin known as vitamin B or the anti-neuritic vitamin, when an individual requires more of it than he is obtaining from his food.

MARROW.—Bone-marrow is a substance found in the inner channels of the long bones of the body. It has to do with keeping up the supply of red blood corpuscles in the blood and is, therefore, a very valuable substance. The marrow from the bones of oxen, sheep and calves can be eaten as an ordinary article of diet or in larger quantities by those suffering from anæmia and similar blood diseases, especially children with rickets, wasting and debility.

MASSAGE.—The word massage is derived from the French "masser"—to knead. In England the practice dates back to about 1800, but in Eastern countries it was known and practised many centuries ago. Ancient documents testify that it was used medically many years before Christ, and in the early Christian era celebrated Greek and Roman physicians prescribed this form of treatment.

We owe much to the Swedish professor Ling, amongst others, who, after deep research upon the subject, introduced the Ling systems of massage and medical gymnastics early in the 19th century. On this foundation our own scientists and medical men have built up a valuable adjunct to the practice of medicine.

Scientifically administered, massage has markedly beneficial results upon the whole structure of the body. Most medical men of to-day realize this and are calling upon it more and more to help in the prevention, relief, and cure of countless ailments and deformities.

The Effects of Massage upon the Body.—The effects of massage are many and varied.

The Circulatory System.—Massage aids the circulation of the bloo. by d..ect pressure and by stimulating the nerves. Thus the blood flow is quickened, nutrition is increased, and the heart's action is strengthened. The quantity of red and white blood corpuscles is increased, especially in the parts under treatment.

The Nervous System.—Massage has a deep effect upon the whole nervous system. This influence varies according to the methods used, which may be either stimulating or soothing. The stimulating movements increase the activity of the muscles, vessels, and glands, which are controlled by the stimulated nerves. The soothing movements relieve pain and nervous irritability.

By the beneficial effect of massage upon the digestion and circulation, the nutrition of the nerves is improved.

The Lymphatic System.—Massage quickens the activity of the lymphatic ducts and glands by direct pressure. Absorption is promoted by pressure on the tissues, thereby getting rid of harmful substances from the body more quickly and easily.

The Respiratory System.—The improved local circulation causes more carbonic acid gas to be formed in the tissues. The lungs

respond to this call for extra activity by deeper breathing.

Digestion.—Massage promotes movements of the bowels by exciting the reflex action of the nerves controlling the movements of the stomach and intestines, and by increasing the amount of bile fluids given out by the liver. It stimulates the nerves controlling the various organs of the abdomen, which results in increased circulatory and glandular activity, thus helping the manufacture of digestive juices by the stomach, intestines, liver, and pancreas.

Massage strengthens the muscular walls of the intestines and abdomen, improves circulation in the walls of the food tract, and thus aids absorption of the digested food substances by the blood and lymph capillaries.

Elimination.—Massage aids elimination of waste products from the body by increasing the activity of the lungs, skin, and kidneys, by aiding absorption and oxidation, and by improving the circulation of blood and lymph.

Kidney activity is directly increased by stimulating the renal plexus in abdominal massage.

The Muscular System.—Massage aids muscle development by improving the circulation and nutrition of the parts treated.

Bone.—The improved circulation of the blood and lymph in the muscles leads to improved circulation and nutrition of the underlying bones. Thus bone development is indirectly influenced by massage.

Massage Movements

Massage movements are classified under the following headings:

Effleurage, Stroking, Frictions, Pétrissage, Tapôtement, Vibrations, Shaking.

Effleurage.—This is a stroking movement, which may be done with either one hand, both hands, or the palmar surface of the fingers and thumb. It may be on the surface or deep, the degree of pressure depending upon the nature of the case being treated. Effleurage is usually performed in the direction of the heart or "centripetally."

The hand should be moulded to fit the contour of the part being treated and the movements should be carried out slowly, smoothly, and rhythmically, if a soothing effect is sought. For stimulating effects brisk and firm strokes are made.

Action.—Effleurage relieves congestion, promotes absorption by quickening the blood and lymphatic circulations, and is, therefore, beneficial in cases of sprain, dislocation, fracture, etc. It is also used for its soothing effect in the treatment of sleeplessness and nervous irritability. It should be freely given at the beginning, during, and at the end of other general and local massage movements.

Stroking.—This movement, which may be done over the clothes, resembles effleurage, but it is often performed in the direction away from the heart or "centrifugally."

It has a very soothing effect and is used to influence the nervous rather than the circulatory system. For example, a general soothing stroking is done with the patient lying on the back with the arms by the sides. A slow, rhythmical movement is begun at the head with the palms of both hands and continued uninterruptedly down the sides of the arms, the front of the body, and down the legs to the feet.

Strong strokings along the course of the colon, or large intestine, besides promoting waves of motion which move forward the contents of the bowel, themselves help to move forward the bowel contents.

Frictions.—In frictions the tissues are moved in small circles upon the underlying structures. This movement may be either on the surface or deep, and is carried out with the pads of the fingers, the ball of the thumb, or the backs of the middle parts of the fingers. By keeping the elbow stiff, the operator can reach the deeper tissues.

Frictions increase the glandular activity of the skin, raise the temperature, and help absorption in the part under treatment. They break up inflammatory products and are greatly used in chronic joint injuries, rheumatism, fibrositis, obesity, constipation, etc.

Pétrissage.—All movements in which the muscles are picked up and kneaded, pressed, or rolled, with one or both hands are called pétrissage.

Pétrissage quickens the blood and lymphatic circulations and brings a larger supply of blood to the part under treatment. It promotes the development and nutrition of weak muscles and the absorption of inflammatory products, and aids digestion. It is used in cases of muscular weakness, obesity, constipation, paralysis, neuritis, sprains,

dislocations, the later treatment of fractures, etc.

Tapôtement.—Tapôtement is done from the wrist and consists of short, sharp blows, made with alternate hands in rapid succession. It may take the form of *clapping* or *hacking*. In the former method the palms of the hands are cupped, in the latter the fingers are loosely extended and the patient is struck either with the pads of the fingers or with their surfaces.

Other methods are *beating* and *pounding*, performed with the palm of the hand or the half-closed fist.



Massage: Petrissage or Rolling and Kneading Movements

Tapôtement directly stimulates the nerves and muscles in the part under treatment.

Thus it aids the activity of the skin and the circulation of the blood, and improves the nutrition of wasted muscles. Given down the spinal region it stimulates the nerve centres. It is beneficial in all cases of muscle wasting, paralysis, rheumatoid arthritis, neuralgic pains, congested liver, constipation, etc. It is not to be given in cases of hyper-æsthesia and inflammation, contracted muscles, chorea, neurasthenia, spastic paralysis, and the early treatment of flaccid paralysis.

Vibrations.—This is a very fine trembling movement of the tissues carried out by either one or both hands, or the tips of the fingers.

This movement stimulates the nerves, and increases the activity of the digestive organs, and the bowels.

It is used in cases of neuralgia, neuritis, anæmia, chronic inflammatory conditions, insomnia, and cases where there is loss of nerve power, etc., but it should not be given in cases of spastic paralysis, chorea, hyper-æsthesia, and acute inflammation.

Shaking.—This movement is similar to vibration, but is larger, stronger, and more stimulating. It may be done with either one or both hands, or with the tips of the fingers.

Varieties and their Uses.—*Stomach pit shaking.*—This is done with the finger-tips of both hands. It is excellent for the treatment of constipation and indigestion, and is useful in cases of swelling of the stomach.

Stomach shaking.—This relieves pain and discomfort, and strengthens the muscular coat of the stomach.

Cross abdominal shaking.—Done with one hand, this stretches adhesions, tones up the walls of the intestines, and is very good for constipation.

Chest lift shaking.—This is done by placing both hands on the patient's back after passing them under the arms. The patient, who is lying on the back with head and shoulders supported on pillows, now breathes in. The operator brings the hands forward to the front of the chest, shaking gently and at the same time slightly lifting the chest, while the patient breathes out.

This is a pleasant movement, which aids respiration and is given in certain cases of heart and lung trouble.

Larynx shaking.—The operator grasps the head with one hand while with the first finger and thumb of the other hand he gently shakes the larynx. This stimulates the parts and helps to loosen phlegm in the throat. It is used in cases of chronic pharyngitis and laryngitis.

Shakings should never be performed where there is inflammation or sensitiveness to a marked degree.

Rules to be Observed During Massage Treatment.—The patient should be in a comfortable and restful position.

The masseur or masseuse should be in an easy position for working.

The room should be sufficiently warm and the patient covered except for the part actually under treatment.

The masseur or masseuse should wash the hands before starting and see that they are warm before touching the patient.

At the beginning of a course of treatment the massage must be light. As the condition of the patient improves, the length and strength of the movements may be increased.

All the movements should be performed rhythmically.

A small blanket and a pillow are useful to cover the patient and to support the part undergoing manipulation.

During the menstrual period it is better to suspend treatment or omit massage of the loins and abdomen.

Qualifications of a Successful Masseur or Masseuse.—Some of the work imposes considerable physical strain upon the operator, and robust health is therefore the first essential for anyone wishing to enter this interesting profession. Other desirable physical attributes are soft, dry, pliable hands and a sympathetic touch. Almost equally important are a sympathetic disposition, tact, and dependability.

Owing to their highly developed sense of touch the blind usually make excellent masseurs, and to cultivate this sense students of massage are encouraged to practise upon each other in the dark.

The training includes instruction in anatomy, physiology, practical and theoretical massage, bandaging, and remedial exercises. Further study of medical gymnastics and medical electricity is now regarded almost as a necessary part of the training, as combined treatment is so often ordered.

The course of instruction takes 1–2 years according to the number of subjects studied.

,Qualified masseurs and masseuses undertake cases only in conjunction with a properly qualified doctor.

General Massage.—This means massage of the whole body. The patient must be undressed, but only the part under manipulation is exposed. One hour is needed for the treatment, the time being divided as follows: the legs, 20 minutes; the arms, 15 minutes; th· chest, 5 minutes; the abdomen, 10 minutes; and the back, 10 minutes.

General massage should not be given within one and a half hours of a meal, and the patient should lie down quietly and rest for one hour after treatment.



Massage: "Tapotement" or Chopping Movement

Head massage is useful in cases of neuralgia, headache, or insomnia.

Face massage is most helpful in cases of facial paralysis, and relieves facial neuralgia.

Abdominal massage is useful in indigestion, constipation, and to increase kidney activity

It helps to remove superfluous fat and to tone up the abdominal walls.

Indirectly it increases the absorption of food substances, stimulates the secretion of gastric juices, and aids the expulsion of gases generated in the stomach and intestines. It assists movement of the bowels and strengthens the muscular walls of the intestines. At least two hours should elapse after a meal before abdominal massage is commenced.

The patient lies down with the shoulders slightly raised and the knees drawn up, separated, and resting upon a pillow.

The bladder should be emptied before the treatment.

Sprains.—Massage is given in order to improve the circulation and thereby secure a better and speedier repair of the damaged tissues, to promote absorption of inflammatory products, and to relieve pain and reduce swelling. It helps to prevent the formations of adhesions and consequent stiffness, and prevents weakening of the muscles.

Light effleurage and gentle kneadings with the fingers are given at first, commencing above the injury, then below it. Treatment is daily. When the swelling has subsided, deeper massage and passive and active movements of the limb are usually ordered.

Dislocations.—Massage may commence immediately the dislocation has been reduced. As in sprains very light daily effleurage is given at first. As the pain and swelling subside, the scope and vigour of the movements is increased. Later careful passive and active movements are introduced, but must be stopped at the first signs of pain recurring.

Fractures.—Massage is often of great value when applied before the fracture is set. It relieves the pain and prevents muscular spasm, but only the very lightest, smoothest, and most regular effleurage, always with the movements towards the heart, may be given.

After the fracture is set, early massage is sometimes ordered. In this case the greatest care must be taken to support the part while bandages and splints are being removed, and for this some outside help will be needed. Light effleurage is given to begin with: first above, then below, but not over the site of fracture. Later on, massage of the whole limb and active and passive movements commence, but must not be allowed to cause pain. The seat of the fracture must always be supported until the bones have completely joined up. Treatment is given daily and the lower splint is usually left undisturbed during the early stages.

Stiff Joints.—When a fracture takes a long time to heal up the joints are liable to become very stiff. Adhesions form round the joint, and the neighbouring muscles are weak and wasted.

If these adhesions have been broken down by a surgeon, immediate massage may be ordered and will consist of light work on the muscles above and below the joint, followed by slow, smooth, and gentle movements of the joint in all its directions.

Housemaid's Knee. Student's Elbow.—These are common forms of swellings caused by pressure. There is swelling of the knee-cap or elbow, accompanied by pain and restricted movement.

In the acute stage rest and heat are generally prescribed, but later on massage and gentle then active movements are given.

Paralysis.—Paralysis is caused by a lesion or injury in the brain, spinal cord, or nerve trunks, which interferes with the normal carrying of nerve impulses or messages.

There may be *motor* paralysis, with loss of movement in the muscles, or *sensory* paralysis, with loss of sensation in the parts involved, or both forms of paralysis, according to the nature and extent of the injury.

Massage is given in order to prevent further wasting of the muscles and to bring about a quicker and more complete recovery. The types of paralysis that respond very well to massage are monoplegia, diplegia, spinal paralysis, facial paralysis and infantile paralysis.

Deformities: Hollow Back (Lordosis).—The patient should lie face down and a pillow be placed under the abdomen. General back massage may be given, with special kneading movements to stretch muscles and tissues in the hollow of the back. The patient is then turned over and strong, stimulating treatment is given to the muscles of the abdomen in order to promote nutrition and strengthen them.

Round Back (Kyphosis).—With the patient lying face downwards, effleurage, kneadings, picking-up movements, stimulating frictions of the spine and plenty of tapôtement are given. Then the chest is massaged with a view to stretching the tight muscles and so straightening the back.

Curvature of the Spine (Scoliosis).—With the patient lying face downwards, the position of the spine is corrected as follows. The arm on the side of the low shoulder is placed above the head, while the arm on the side of high shoulder is extended along the side of the body.

Stimulating massage is given to all the stretched and weakened muscles on the side of the convexity, and stretching movements are given to the contracted muscles on the side of the concavity.

Knock-Knees.—Massage improves the circulation, nutrition, and elasticity of the stretched muscles and ligaments. It should be given to all the thigh, leg, and foot muscles, and followed by special exercises for knock-knees.

Club-Foot (Talipes).—This is often a result of infantile paralysis. The affected muscles waste very quickly and their opposing muscles, having too strong a pull, cause the deformity. Early massage is useful for strengthening the weak muscles and stretching the contracted ones. The whole limb should be included in the treatment.

Flat-Foot.—Massage is given to the whole leg, with special attention to the muscles of the sole of the foot, the inner side and front of the ankle, and up the front of the leg to the knee.

Effleurage, pétrissage, and tapôtement are applied and followed by active movements and special exercises. It is useful to take impressions of the foot on paper from time to time, so that the improvement may be noted.

Wry-Neck (Torticollis).—Treatment by massage is often very satisfactory for this condition, especially if the cause is rheumatic. Gentle, slow, and rhythmic effleurage on both sides of the neck has a soothing effect and causes the contracted muscles to relax. Light kneadings and frictions may then be given, followed by deep massage, and finally passive, active, and resisted movements of the head.

General Principles of Massage for Heart Diseases.—The rule of not giving massage treatment without the instructions of a doctor ought to be most strictly observed in the case of patients suffering from any form of heart trouble. The aim of massage, when ordered, is to lessen the work of the heart, which can be done in the following ways: By relieving congestion of the circulation in all parts of the body and thereby indirectly strengthening the heart muscle. By relieving congestion of the liver by gentle kneading and of the intestines, colon or large intestine by stroking and frictions. By encouraging deep breathing and by giving chest lifting and stroking in order to relieve congestion of the lungs and to assist the interchange of gases. The principal movements are effleurage and slow rhythmical kneading. The limbs should be slightly raised and supported on a pillow during treatment.

Arterio-Sclerosis.—This condition is sometimes improved by massage, which aims at relieving congestion, improving general health, assisting the blood circulation, and reducing excessive weight. The movements used are effleurage and gentle kneadings.

Varicose Veins.—The object of massage is to relieve swelling and congestion in the limb, and to restore the tone of the muscles through which the veins pass.

The limb is raised and given light massage and gentle kneading, the area immediately surrounding the varicose veins being avoided. After the massage a crêpe bandage is put on and active and passive movements are given.

Massage for Abdominal Conditions.—Cases of chronic gastritis, chronic swelling of the stomach, and nervous dyspepsia often benefit from a general massage of the whole body. Special slow stomach stroking towards the pylorus, to aid the passage of the stomach's contents, and fine vibrations may be given with gentle pressure upwards against the abdominal wall.

Abdominal massage helps constipation.

Visceroptosis (or Dropping of the Abdominal Organs.)

Aims of Treatment.—The object of massage is to improve the tone and elasticity of the abdominal muscles so that they will give firmer support to the internal organs, and to strengthen the muscles of the pelvic floor.

The patient lies on the back with a small pillow under the head; the knees are drawn up and supported by pillows. The foot of the bed may advantageously be raised on blocks. The treatment consists of strong abdominal massage with stimulating vibrations and tapôtement. As far as possible pressure is always upwards.

Chronic constipation.—Deep abdominal treatment should be given. The patient

lies on the back with the shoulders raised and the knees drawn up and supported by pillows. The treatment commences with abdominal stroking and is gradually worked into deep kneading and deep frictions along the course of the colon, or large intestine, pressure always being exerted in the direction of the rectum. Vibrations and tapôtement over the liver are given and deep breathing should be encouraged. Active abdominal exercises should be carried out after the massage.

Massage after an Operation for Appendicitis.—Some considerable time after the operation massage may be ordered to assist absorption, stretch adhesions, restore the tone of the muscular walls of the intestines, to aid movement of the bowel, and to strengthen the abdominal walls. Massage must be light at first and great care taken in working round the sensitive area. Effleurage, light picking up, gentle kneading, frictions, and fine vibrations are given. The patient is encouraged to breathe deeply, and to practise contracting the abdominal muscles.

Gout.—Massage is given between attacks to improve the circulation and general health, to increase the outflow of urine, to remove swelling, and to reduce the gouty thickenings round the joints.

Obesity.—Vigorous general massage is given to break down and remove the fatty deposits in the tissues, and to improve muscular tone. The patient's weight is thus reduced and his general health benefited.

Rickets.—General massage is given to help malnutrition, prevent deformities, and to improve the general health. Olive-oil may be rubbed in to nourish the tissues.

Anæmia.—General massage is given to increase the number of red corpuscles in the blood and to improve general health by aiding the circulation, digestion, and respiration.

Neurasthenia.—A very soothing general massage may be given, avoiding all stimulating movements and paying special attention to any symptoms.

Neuralgia.—Soothing effleurage, strokings, and gentle kneading are given over the affected area and along the course of the nerve involved.

Neuritis.—After the acute stage has passed, massage is given to prevent the rapid wasting of muscles which often follows neuritis. The treatment aims at soothing the nerves, improving their nutrition, breaking down adhesions, and strengthening the muscles.

Sciatica.—After the acute stage massage is given to soothe the nerve, to relax the contracted muscles, and to increase the movements of the joints. It should commence lightly on the front of the thigh and be gradually extended until the whole leg can be given deep kneadings and stretching frictions. These movements follow the course of the nerve from the spine, over the buttocks and down the back of the leg to the foot.

Writer's Cramp.—Soothing strokings are given from the shoulder to the hand to relieve the cramp. Kneading and picking up of the muscles to aid circulation and nutrition are gradually introduced and the chest, shoulder, and upper part of the back come into the treatment. The patient should be encouraged to practise actions which bring into play muscles opposed to those used in writing.

Such actions consist of extending fingers and thumb; opening fingers and thumb fan-wise, and extending the forearm and bending the hand backwards.

Chorea.—The aim of massage treatment of this condition is to soothe the whole nervous system, to restore muscular control, to strengthen the muscles, and to improve the general health of the patient.

Passive, active, and resisted exercises are gradually introduced into the treatment. Balance exercises are especially useful to teach proper muscle control. (*See also* REMEDIAL EXERCISES.)

Insomnia.—Good results are obtained from this treatment. The patient retires for the night and the lights are lowered. Soothing strokings are given down the spine, followed by nerve frictions and muscle kneading. The patient then settles into a comfortable position for the night and soothing head massage is given until sleep is induced.

Fibrositis.—Heat and soothing massage are given in the early stage of fibrositis. In chronic cases very deep, strong movements are indicated in order to break up and remove the nodules or swellings and patches of thickening, to increase the movement of the joints, and to aid the elimination of

poisons by improving the circulation and the function of the skin and kidneys.

Lumbago.—This is a form of fibrositis which attacks the muscles of the back. In the early stages soothing strokings are given to relieve muscular spasm, and finger kneading to reduce any fibrous thickenings. In chronic cases very vigorous and deep massage is necessary. Deep frictions are given to any swellings and thickenings until they disappear, and generally some form of electrical treatment is ordered in conjunction with massage.

Rheumatoid Arthritis.—In chronic cases strong massage is given to reduce thickenings and adhesions round the joints and to improve movement by stretching contracted, and developing wasted muscles. Usually the massage is preceded by electrical treatment and followed by passive and active movements, carried as far as it is possible to go without causing pain.

MASSETER.—The masseters are a pair of muscles passing over the ends of the jaws in front of the ears. They are the chief muscles used in chewing. (*See also* JAW.)

MASTICATION.—By mastication we mean the act of chewing. Chewing food is really quite a complicated process which is carried out by the combined action of the jaws, tongue, cheeks and the muscles which serve them. The food is bitten, chewed and mixed up with saliva in the act of mastication, and good mastication is necessary in order to turn the food into the pulpy well-salivated mass which is suitable for swallowing into the stomach.

MASTITIS.—Mastitis is another name for inflammation of the breast. It is fairly common in nursing mothers and is then usually due to the blocking of a milk duct with hardened milk, or to infection which has reached the interior of the breast through a crack in a nipple. (*See also* BREAST.)

MASTODYNIA.—Any pain in the breast may be called mastodynia, though it is often used to refer to a neuralgic ache for which there is no apparent organic cause. Very heavy and pendulous breasts often ache, and a loose support such as a well fitted bust-bodice will give relief. Some women feel neuralgic pains in the breasts at special times or when they are tired and run down. It must never be forgotten, however, that a woman who is not used to having pain in the region of the breast, should have herself examined by a doctor when such a pain appears, because it may be the beginning of some more serious condition. For fleeting attacks of mastodynia warmth over the breast or a belladonna plaster will usually give relief. (*See also* BREAST.)

MASTOID.—The mastoid process is part of the temporal bone of the skull; it is the rounded part that projects behind the ear and contains numerous air cells, the purpose of which is to protect the delicate structures of the ear. The air gets into these air cells from the middle ear, behind the ear drum, to which air is brought from the throat through the Eustachian tube. It will thus be seen that germs or inflammation can spread from the throat up to the middle ear and on to the mastoid cells, the largest of which is called the mastoid antrum.

MASTOIDITIS, or inflammation of the mastoid, is a serious disease, which may spread to the brain and cause meningitis, or may cause blood-poisoning by pouring the poisons of the inflammation direct into the blood-stream. The *simple mastoid operation*, however, is very effective when performed early and leaves no ill-effects. The *radical mastoid operation* is done in chronic cases and in brain complications; it brings about deafness, as the whole middle ear has to be cleared out in this operation, but sometimes a certain degree of hearing remains.

MASTURBATION, or self-abuse, is a bad habit which is common among adolescents, and to which all kinds of serious nervous and mental diseases, such as locomotor ataxy and general paralysis used to be attributed. Such diseases are, however, now known to be due to an old syphilitic infection or to other causes, and masturbation is no longer blamed for them, but it may be one of the symptoms, though not a cause, of mental disorder. In infants, masturbation is merely a reflex action due to the irritation of a tight foreskin or to intestinal worms, and is curable by attention to these. Most adolescents grow out of the habit, which, though not a healthy one, is not, within limits, one to be taken too seriously. (*See also* SEX HYGIENE; PSYCHOTHERAPY.)

MATÉ.—Maté is a tea infused in exactly the same manner as ordinary tea from the leaves of a plant found in South America. It is a little more bitter than ordinary tea

but is quite pleasant to drink. It does not contain as much caffein as ordinary tea, and is therefore prescribed as a substitute for tea in cases where ordinary tea is bad for the individual. (*See also* CAFFEIN.)

MATERIA MEDICA.—Materia medica is the old name for the science of drugs. This is now called *pharmacology*, which includes the action of drugs upon the body.

MATERNITY BENEFIT.—A woman who is insured under the National Health Insurance Act, or who is the wife of an insured man, is entitled to a maternity benefit on the birth of a child. For details see the article on NATIONAL HEALTH INSURANCE ACT.

MATLOCK.—Matlock is, like Buxton, a hill spa and health resort in Derbyshire. It is very pleasantly situated on wooded hillsides over the picturesque gorge and valley of the River Derwent. The air is bracing, but it has not quite the tonic quality of Buxton, being warmer and at a considerably lower altitude. Its waters are used almost entirely in the form of baths. They contain calcium carbonate and magnesium sulphate and are very pure, with a slight radio-activity. They are useful for gout, rheumatic joints, sciatica and lumbago. Cases of high blood-pressure and some types of heart disease are benefited by a stay at Matlock. The place is chiefly famous, however, for its great hydropathic establishments, which remain open all the year round for treatment and as holiday resorts.

MAXILLARY BONES.—The maxillary bones are the pair of bones which form the upper jaw. They reach from the eye sockets to the lower jaw mouth, and from the cheek bones to the side of the nose. Each maxillary bone, or maxilla as they are also called, contains a hollowed-out cavity called the maxillary sinus or more commonly the antrum. This sinus opens into the top of the nose and so is liable to infection from the nose. If it becomes infected it may be very troublesome, because of the difficulty in draining itself. (*See also* ANTRUM; JAW.)

MEASLES.—This is a very infectious disease which is common amongst children in springtime. In most places it is now notifiable to the Public Health authorities. The incubation period, or time it takes to develop after exposure to infection, is three weeks. It is worthy of note that measles is much more serious in children of under five years of age than in older children.

Symptoms.—The first sign the mother notices is that the child is off colour for four or five days, and seems to have a bad cold in the head with running eyes and nose. If the mother looks inside the child's mouth at this period she may notice some little white patches the size of a pin head on the inner side of the cheek which are typical of measles, and the child will by this time have developed a hard ticklish cough. On the fourth day of the illness the child becomes very feverish and a rash appears first behind the ears and round the mouth and spreads rapidly all over the body. The rash is red and blotchy and may last from three to five days. It is accompanied by fever, which disappears as the rash fades. The cough becomes less troublesome and the child feels much better but should be kept in bed until the cough has entirely disappeared.

Mothers do not, as a rule, realize the seriousness of measles, and sometimes allow the rest of the children to sleep in the same room, so that "they may all get it while they are at it." This is a wicked thing to do, because more children die from the complications of measles than from any other infectious complaint.

Complications: *Pneumonia.*—This is the most usual and serious complication and is generally the result of letting the child get out of bed too soon. *Ear troubles* sometimes occur and require skilled attention. *Eye trouble*: Any discharge from the eyes or ear should be reported to the doctor at once, as careful attention is needed. Neglect of the right treatment under these circumstances has been known to lead to permanent deafness or blindness.

Treatment.—The doctor should be in attendance on all cases and, wherever possible, the child should be isolated and treated at home. The treatment is simply to make the patient sweat and keep the bowels freely open. This can be accomplished by putting the child to bed with lots of blankets and a fire in the room. A dose of opening medicine, preferably castor-oil (one tablespoonful for a child of seven and two teaspoonfuls under that age), should be given, followed by a daily dose of milk of magnesia, unless there are signs of diarrhœa.

All through the illness it is advisable to

give the child as much fluid to drink as possible in the form of ordinary cold water, lemonade and orangeade made from fresh fruit, barley water (made by boiling and straining pearl barley) or imperial drink, made by mixing the lemonade and barley water together. If the child is restless and hot it should be sponged down frequently with lukewarm water with a drop of disinfectant in it. The room should be kept darkened, as the light is irritating to the child's eyes. This can be accomplished by using dark blue or green curtains. The window should be kept open, but care must be taken that the bed is not in a draught; that is to say, it should not be placed between the window and the door or between the chimney and the window or the chimney and the door. If the room is built in such a way that the bed must be in one of these bad positions, then a screen must be used. A useful screen can be made by arranging a blanket or a rug over a clothes-horse, or by tying a rope from the top of one bed-post to the other and throwing a blanket over it.

The *eyes* should be bathed hourly with a soft piece of cotton-wool dipped in weak boracic lotion, each piece being burned as soon as it has been used once. The *mouth* should be swabbed three times a day in the same way with glycerine and borax or hydrogen peroxide or glycothymoline. If the *ear* discharges or if there is pain behind the ear, the doctor should be informed at once. The *cough*, which is the most troublesome feature, is treated by medicine to loosen and soothe it. It is a help to rub the chest with goose grease or camphorated oil and cover it back and front with a little plain cotton-wool. In cases where the cough remains hard and troublesome, antiphlogistine (obtained from any chemist, with directions for use on the jar) should be applied on the back and front of the chest morning and evening. Antiphlogistine is best applied on plain white lint, but if this is not obtainable, an old flannel shirt can be cut up for the purpose. It requires to be warmed before putting on, and to test the heat the mother should place it against her own cheek. After it is applied to the skin the chest should be covered with cotton-wool back and front, or with *gamgee*



A Modern Hospital Dispensary [*Courtesy of Princess Beatrice Hospital*]

tissue made in the form of a pneumonia-jacket. If the child is likely to be ill for some days it is wise to make two jackets so that one can be aired while the other is in use. A steam-tent is also of value in helping the child to breathe more easily. It can be rigged up by attaching four poles to the corners of the bed and throwing over a sheet, so that one side is left open, through which the steam comes from the boiling kettle. A teaspoonful of Friars' balsam should be added to the water each time the kettle is filled.

Whoever is looking after the child should take great care not to carry the infection to other people in the house. She should have a long-sleeved overall hanging on the back of the door and should put it on whenever she enters the room, taking it off when she leaves the room again. A bowl of water containing a teaspoonful of lysol, Milton, or carbolic, should be placed in the room and the hands must be washed in this each time before leaving the room. An old sheet soaked in one of these disinfectants may be hung over the outside of the door and nobody except the doctor should be admitted to the room.

As regards the question of returning to school, the child should not be allowed to return under fourteen days from the date of the first signs of the appearance of the rash, and a child who has been exposed to infection should not return until sixteen days have elapsed. (*See also* DISINFECTION; GERMAN MEASLES; INFECTIOUS DISEASES.)

MEAT.—The place of meat in the diet is discussed in the SPECIAL SUPPLEMENT ON DIET AND INVALID COOKERY at end of book.

MEATUS.—The word meatus refers to a passage or tunnel in the body. The passage in connection with which it is most generally used is the external auditory meatus or ear-hole. (*See also* EAR.)

MECKEL'S DIVERTICULUM.—*See* DIVERTICULUM.

MECONIUM.—For the first two days of an infant's life it frequently passes motions of a dark greenish-black sticky fluid. This substance is called meconium. After the first forty-eight hours of life the meconium disappears and the normal baby stools appear. (*See also* STOOLS.)

MEDIASTINUM.—The space lying between the two lungs is called the mediastinum. It contains the heart, the windpipe and gullet, and the aorta and other great blood-vessels of the chest.

Inflammation occurring in this region is known as *mediastinitis*. Such inflammation may spread from the neighbouring organs and may be the result of some such condition as pleurisy. The mediastinum is abundantly supplied with lymph glands and any trouble in the region is apt to spread through these glands, often causing a serious infection and even death. (*See also* PLEURISY.)

MEDICAL GYMNASTICS or SWEDISH REMEDIAL EXERCISES.—The idea of remedial exercises was originally evolved by Professor Ling, the Swedish pioneer, who introduced his system in Stockholm in 1813. Since then much progress has been made, but underlying all modern medical gymnastic practice are the fundamental principles of the Ling system.

Remedial exercises consist of positions or movements of the body performed by the individual, either alone or with assistance, and by their aid many physical deformities, inherited or acquired, may be corrected either totally or in part.

General Principles for the Administration of Remedial Exercises.—1. The exercises and their strength should be adapted to the age, constitution, and strength of the patient;

2. Nervous and highly-strung patients should be given slow, rhythmical, soothing exercises; lethargic patients need brisk, stimulating exercises, which demand attention and alertness;

3. The patient should never be allowed to get over-tired or breathless;

4. Passive movements should precede active, which in turn are followed by resisted movements;

5. Breathing exercises should always commence and terminate the treatment, and they may also be freely interspersed throughout;

6. When resistance is given it should begin weak, wax to strong in the middle of the movement, and wane near the end. If trembling or jerks occur, either the exercise or the resistance is too strong for the patient;

7. The patient should not be tired at the beginning of a treatment and benefits more when the treatment is followed by a rest.

MEDICAL OFFICER OF HEALTH.—By the Public Health Act of 1872 authority was

given to urban, rural and other sanitary authorities to appoint medical officers of health. These medical officers have charge of all public health work under the town council such as child welfare, school medical inspection, housing, etc. A special course of study is usually required for a medical officer of health and an additional diploma in public health (D.P.H.). (*See* SPECIAL SUPPLEMENT ON CHILD WELFARE.)

MEDICINE CHEST.—In every household it is as well to keep a supply of the common remedies which are required from time to time, and these are better kept under the care of one responsible person, such as the mother of the family, in a cupboard by themselves and well out of reach of toddling children, as there is always a fascination for small children in a collection of little bottles and boxes such as would be contained in the medicine chest. It is infinitely better, too, to keep anything containing poison in a separate place. It is so easy when one is in a hurry and off one's guard to reach down the wrong bottle. As a general rule the ordinary mixture dispensed for a particular illness should be emptied out when the illness is over, as most mixtures will not keep indefinitely; but of course anything that may be required again soon and everything that will keep should be saved.

With regard to the contents of the medicine chest they must, of course, vary with the income and the needs of the family. The great stand-bys that are always needed sooner or later by a family are simple dressings, a purgative and an aperient, castor oil for the purgative, and health salts of some sort, liquid paraffin or cascara. Something for feverish colds, such as aspirins, ammoniated tincture of quinine; something for headaches or neuralgic pains, Antikamnia or any other tablet that is liked. Camphorated oil or goose grease, for rubbing chests. Peppermint essence or chlorodyne for colics. Other things that frequently come into use are vaseline, calamine lotion, glycerine, zinc ointment, ipecacuanha wine, and a jar of Antiphlogistine. If there is a rheumatic tendency in the family, some ointment of methyl salicylate or liniment should be handy. Simple dressings for cuts consist of cotton-wool, lint, and bandages of two or three sizes. Iodine, bicarbonate of soda and boracic acid are useful in every household. Cleaning materials such as salts of lemon should never be kept with the domestic remedies. In fact it is better to buy them only in such quantities as can be immediately used and the remainder thrown away. Many deaths have been caused in the past through salts of lemon being mistaken for some harmless white powder such as bicarbonate of soda.

MEDITERRANEAN FEVER.—A feverish disease caused by a milk infection and prevalent along the coasts of the Mediterranean Sea, on the island of Malta and on Gibraltar. It is described under its more common name of MALTA FEVER.

MEDULLA or BULB, is that part of the nervous system which lies at the back of the head, occupying the lowest part of the skull and which joins the brain above to the spinal cord below. The size of the medulla is about $\frac{3}{4}$ inch across and $\frac{3}{4}$ inch long and within this tiny compass are contained all the means by which we are able to move our limbs; to feel such things as pain and temperature in every part of the body; and, most important of all, by which we are able to breathe. The action of the lungs is controlled by nerves which have their endings in the medulla, and if these nerves are injured breathing stops at once and death results. Normally, of course, we are completely unconscious of the way these nerves work, and when they cease to work, death takes place so rapidly that the individual has no time to realize what has happened.

MEGALOMANIA is an exaggerated belief in one's own power or ability. It may perhaps best be described as an *insane conceit.* The person who suffers from megalomania in a mild form is the typical "reformer," who sets out to put the world right, according to his own point of view, by imposing his will upon those whom he can persuade to follow him. No task is too big to be attempted, no obstacle too great to be overcome by the victim of megalomania. Before the real nature of his mental trouble is realized, he may have recruited an army to rescue an oppressed nation or have raised large funds for his pet charity by his overwhelming persuasiveness. Sooner or later, however, the victim of this form of mental disorder over-reaches himself, and by showing that he has lost all sense of proportion in his enterprise, whatever it may have chanced

to be, the fact that the pioneer or reformer is mentally abnormal gradually dawns on his adherents. Simple megalomania is fairly common in a mild form, but as a symptom of more serious mental trouble it is very common. One of the first symptoms of *general paralysis of the insane* (q.v.) is often megalomania; a patient with weak flabby muscles will announce himself with great assurance to be the boxing champion of the world, or say that he can make 1,000 runs in the Test Matches without difficulty; or, being a relatively poor man, will solemnly declare he is going to give £1,000,000 to charity. These are very obviously examples of megalomania and can easily be disproved. But some less obvious examples often occur in the early stages of general paralysis and there may be some difficulty in proving that the patient has no grounds for his wonderful belief in himself and his powers.

MEGRIM.—This condition is described under its more usual name of MIGRAINE.

MELÆNA.—By melæna is meant the dark-coloured, almost black, stools which contain blood and are passed in conditions like ulceration of the bowels or stomach. The bleeding when the stools are black is usually from the lower part of the stomach, the duodenum or the higher parts of the small intestine. Bleeding from the stomach proper is usually vomited, and bleeding from the large intestine is more or less its normal colour. It must be remembered that many mixtures which are taken as medicine will darken the stool, notably those containing iron and bismuth. (*See also* STOOLS.)

MELANCHOLIA is a type of disorder of the mind in which the outstanding symptom is depression, which may be so marked that the patient seeks refuge in suicide. The bodily health is also affected in this disorder, and the patient looks and feels physically ill as well as being mentally sick. The mental picture in melancholia is one of utter misery. The patient is intensely miserable and the best news in the world would not bring a smile to his face. Many patients suffer from great *anxiety* (q.v.) and often have delusions which they think must account for their misery. For example, the patient with melancholia says that he has committed the "unpardonable sin," and is "forsaken by God," so how can he be anything but wretched? Delusions of past sins are very frequent and one of the most favourable signs of approaching recovery from this form of mental trouble is the recognition by the patient that these delusions have no foundation in fact.

Melancholia is a disorder that occurs mainly in middle life, and is rather more common in women than in men. It is especially common in women about the time of the change of life and many a mild case of melancholia goes unrecognized as such, the utter misery and depression being put down to the "change of life." The outlook in melancholia is good if the patient is properly treated and is kept from committing suicide. These patients *are* physically ill; they become very thin, their complexions get muddy, and constipation is always marked. The digestion is poor, and this, together with the fact that many patients have delusions about being unable to eat, soon leads to what is practically starvation. For this reason, if for no other, it is advisable to have these patients under supervision in a mental hospital. The chief dangers in melancholia are lack of nourishment and suicide. It is often necessary to guard against suicide by strict observation both day and night, and the refusal to take food may have to be met by forcible feeding. This is not such a dreadful or unpleasant proceeding as most people imagine, and many patients are fed like this for months and grow fat on the diet which is so given them, one day deciding that they prefer to take their food in the ordinary way. Rest, and treatment of the physical state, is all important. Open-air treatment—rest in bed on a veranda or in the garden—sometimes works wonders, especially when combined with treatment of any septic condition of the mouth, throat or nose which may be contributing to the mental breakdown. During convalescence, tactful handling of these patients is necessary as their memories are good and they can remember everything that has happened to them whilst they have been ill. Relapses may occur in melancholia, but provided that the patients weather the actual attacks, the outlook for ultimate recovery is good.

MELANOTIC CARCINOMA, or MELANOMA (Greek, *melan*, black.)—This is a tumour, occurring at all ages, which contains a great deal of melanin pigment, or dark brown or black colouring matter; this

colouring matter is formed by some of the skin cells, whose particular work it is. Sometimes the pigment is increased in special areas, for some unknown reason, and a small pigmented patch called a pigmented mole results. This may remain very small, and never cause any trouble; on the other hand, it may be excited by some unknown irritant, when it grows rapidly, ulcerates, and spreads with extraordinary rapidity along the lymph channels. Indeed, quite often the first sign of anything wrong is the enlargement of the neighbouring lymph glands, which frequently form tumours considerably larger than the original growth. This may, on the other hand, be sometimes so small as to be missed entirely.

In some cases the spread is universal throughout the body; this usually occurs at a fairly early stage of the disease. The secondary growths are generally more deeply pigmented than the first; they may be quite coal-black. In recurrence of the disease, which sometimes follows after operation, the colouring matter may be absent. The urine is also darkened in colour by the presence of the pigment.

Treatment.—The outlook in these cases is very grave. If, however, the disease has not progressed too far to be operated upon, the only possible treatment is immediate removal of the growth. This is done very thoroughly: the mole, the tissues beneath it, the nearest lymph glands, and the subcutaneous fascia, or flattened tissue lying beneath the skin, between the growth and the glands, must all be removed. Radium and deep X-ray treatment may also be useful. (*See also* CANCER; CANCER OF THE SKIN.)

MEMBRANE.—A membrane is a thin sheet of tissue covering or lining any organ of the body. Membranes such as those lining the intestines, the nose, etc., which are moistened by the sticky fluid substance called mucus, are called the *mucous membranes*. In a state of ill health these mucous membranes are apt to develop an additional amount of mucus and catarrh is produced.

The largest single membrane of the body is the *peritoneum* or lining of the abdomen. It is not a mucous membrane, but has a smooth moist surface which is well adapted for moving easily over the organs contained within it. The membrane which lines the chest and covers the lungs is called the *pleura*. There are many smaller membranes throughout the body, such as the small membranes which lie between bones. The coverings of muscles called *fascia* are fibrous membranes.

MEMORY is the result of a storing up of impressions in our minds by which we are able to recognize these impressions when they present themselves again. There are four things which must happen in order that memory may be formed: first, the mind must register the impression; next, the impression must be retained in the mind; thirdly, the impression must be reproduced, that is to say, we must become aware of it; and lastly, we must recognize the fact that we have experienced that particular impression before. Many of the complaints of "loss of memory" are false, because either through lack of interest, inattention or absent-mindedness, no mental impression was ever originally received and, therefore, nothing could be retained. Much of the "loss of memory" in the elderly is of this nature. Many elderly people have an excellent memory for things which happened long ago, but things which have only recently occurred are forgotten, not because "memory" is at fault, but because their brains are unable to receive any more mental impressions and so nothing can be retained. People vary very much in their power of memory. Some people are able to recall better what they read than what they hear, in other words, the mental impression they get from vision is stronger and more readily retained than that which they get from hearing. Such people are called "visual memorizers." Most people are of this type, hence the popularity of reading text-books instead of attending classes at schools and in training for the professions. Some people have the power of "photographing" on their brains, so to speak, everything they read, and they are the people who are able to recite large numbers of curious facts and give others any information on any subject. But most of us find that it is easier to remember by "association." That is, we form "links" in our minds between new impressions and those which we have experienced before: one thing reminds us of another, and so a chain of thought is created which lays down a new impression to be stored and reproduced when required.

Memory fails not only in old age, as has already been described, but also in many disorders of the mind. One of the earliest symptoms of *general paralysis of the insane* (q.v.) may be failure to recall at will impressions previously recorded. In such conditions as *senile dementia*, or *confusional insanity* (*see* INSANITY), loss of memory is a striking feature, and it also occurs in certain forms of chronic alcoholism. In alcoholism the loss of memory is peculiar in that recent events are not remembered, but things which happened long ago can be remembered perfectly. If recovery takes place, memory returns, showing that the cause of this loss of memory is quite different to the cause of the loss of memory in old people.

There are various systems of "memory training" which are much advertised. These all depend on "association," on linking up impressions which have been previously received and they are of a certain value in training people to make the best of the memory they possess. But the real memory is inborn and although it may vary if the individual is tired, exhausted, or physically ill, yet just as some folk are blue-eyed, and some are brown-eyed, so some have good memories and some have bad, though a sudden change in the memory from good to bad should be looked upon as suspicious of mental or physical illness.

MENDEL'S LAW.—An Austrian naturalist, Johann Mendel, who lived from 1822–84, conceived a theory dealing with the inheritance of characteristics, by which he stated that when two individuals, each with a definite characteristic, mate, their offspring will have only one of their characteristics, known as the dominant, and the other characteristics will be recessive or undeveloped. The offspring of the second generation, however, if they intermarry, will possess both the dominant and recessive characteristics in varying degrees.

MENIÈRE'S DISEASE or SYNDROME.—Menière's disease is a chronic progressive disease in which there are attacks of giddiness, deafness on one side of the head only and noises in the head (tinnitus) and vomiting. The cause of Menière's disease is not known. It used to be thought that it was due to a sudden hæmorrhage into the semicircular canals, but this is no longer considered to be the cause of it; it has been called a kind of epilepsy of the nerve of hearing.

Treatment.—Sometimes the condition improves considerably of its own accord, otherwise the recognized forms of treatment are inflation of the ear passages by the eustachian catheter, and clearing up of any unhealthy condition in the nose or throat. Some doctors put their patients to bed and give them potassium iodide, and in very rare cases an operation is performed. (*See also* EAR; TINNITUS.)

MENINGES are the coverings of the brain and spinal cord which protect the delicate nervous structures from injury and also serve to carry the blood away from the brain when all its oxygen has been used up by the tissues. There are three layers to these coverings: the outermost one is the *dura mater*, a thick, strong layer which lines the skull and the canal in which the spinal cord lies, being continuous through a hole in the bottom of the skull through which the spinal cord passes from the bulb. The *arachnoid*, which is the next innermost layer, is a much more delicate, filmy structure, whilst the *pia mater*, which lies in direct contact with the brain and dips into the folds of the brain is even more fragile. In between the arachnoid and the pia mater there is a small space, filled with a fluid produced in a gland-like structure in the brain. This fluid, called cerebro-spinal fluid, circulates all over the brain substance and the spinal cord, and is the fluid that actually nourishes the brain, the gland-like structure extracting from the blood just those things which are required to nourish the brain and rejecting the remainder. Sometimes the pia mater and arachnoid get stuck together, so that the fluid is no longer able to circulate freely. When this happens, the fluid gets dammed back into certain parts of the brain, producing what is called a hydrocephalus or "water on the brain." (*See also* HYDROCEPHALUS.)

MENINGITIS is inflammation of the meninges (*see* MENINGES), and it may occur as a result of some general disease of the body, as tuberculosis, or it may be caused by the spread of some disease in the ear or nose through the skull into the meninges. One particular form of meningitis is called CEREBRO-SPINAL FEVER and has already been dealt with under that heading. The general symptoms of any form of meningitis are the

same; they differ only in their severity, and it must be realized that any form of meningitis except cerebro-spinal fever, in which special measures can be taken to kill the germ causing the disease, is nearly always fatal. The forms caused by spread of germs from the ear or nose can very occasionally be said to recover, but recovery from the form due to tuberculosis has never been known.

The symptoms of meningitis depend on two facts, one that the germs causing the condition irritate the delicate membranes and the brain tissue which lies under them; the other, that the skull is a closed box and any increase in the contents of that box, such as occurs in meningitis, gives rise to a certain pressure.

The meningitis of tuberculosis is always found with tuberculosis in some other part of the body. It occurs more commonly in children than in adults. The early signs are those of a general upset of health; the child becomes irritable, out of sorts, is frequently sick for no apparent reason and is constipated. Then signs of irritation of the meninges begin to appear: severe headache is complained of, the child may develop an obvious squint and may have a fit. By this time the child will be unwilling to be examined or questioned, but will lie curled up in bed, probably with its head buried in the pillow to avoid looking at the light. There may be some rise of temperature, and the temperature as a rule goes on rising until just before death. Pain is a most distressing feature of the disease and the child often gives rise to a plaintive cry which once heard is never forgotten. The head is held back with the chin tilted into the air. A certain sign, called "Kernig's sign," is nearly always present in these cases: if a child is placed on its back in bed so that one leg is resting on the bed and the other one is bent at the hip and knee, it is found that it is not possible to straighten out the bent leg at the knee joint without causing pain to the patient and pulling up the leg which rests on the bed. The course of the disease may be weeks, or it may end quite quickly, within a week, following a few days of merciful unconsciousness. It is impossible to tell how long the patient will live. The condition is recognized and the type of germ causing the meningitis is determined by withdrawing some of the cerebro-spinal (*see* MENINGES) fluid from the spinal canal with a needle. In cases of meningitis, the fluid drawn off consists of pus in which the germs can be seen under the microscope.

Treatment up to the present has been hopeless in cases of meningitis caused by the germ of tuberculosis. All that can be done is to keep the patient as comfortable as possible by ice-bags to the head and cold sponging. Withdrawal of cerebrospinal fluid relieves the headache for a time in all cases of meningitis. In those forms in which the germ has come from either the ear or the air spaces connected with the nose, a certain amount of help may be given by the injection of serums prepared from dead germs of the same type, or of their poisons which have been made harmless. But the hope is a faint one and in any case of true meningitis except cerebro-spinal fever it would be wrong to hold out any real hope of recovery; cases which recover are cases of brain irritation resembling meningitis but without a real infection of the meninges being present.

MENINGOCELE is a lump which may appear in the mid line of the back of a newly-born child at any place from the bottom of the skull to the lowermost part of the spine. This lump is made up of the meninges (q.v.) of the spinal cord and its appearance is due to the fact that there has been an error of development and the bony parts of the spine have not joined up as they should. When the baby coughs or cries, the lump gets larger and can be felt to be soft, with fluid contents. Meningocele is a very mild form of the errors in development which may happen to the spinal cord and its meninges. In the worst forms the whole spinal cord opens on to the skin, and this, of course, does not allow of the child living more than a few days. Meningocele may sometimes be treated by surgery, and the lump taken away without damage to the spinal cord underneath; but many cases are best left untouched, since the condition gives rise to little or no trouble, and the lump should then be protected by a suitable shield. The surgeon is the only person who can safely decide whether it is advisable to remove the meningocele.

MENOPAUSE.—The change of life which occurs in women between the ages of forty-five or fifty. (*See also* CHANGE OF LIFE; MENSTRUATION.)

MENORRHAGIA.—This is the name given to excessive loss of blood during the menstrual period. (*See also* FLOODING; MENSTRUATION.)

MENSES.—The monthly periods in a woman. (*See also* MENSTRUATION).

MENSTRUATION.—Menstruation is the medical name for the monthly loss of blood which occurs normally in adult women, and which is popularly called by such names as "the courses," "the periods," "being unwell," etc. It consists of a periodic discharge from the womb. Every woman differs both as regards the duration of the periods and the length of time between them; for example, bleeding may occur at intervals of three to five weeks and may last for as short a time as two days or as long a time as ten days. But each woman should be regular in the type to which she belongs. If she has a three or four days' flow every twenty-eight days, which is the most usual period, she should be able to count on the period appearing every four weeks with great regularity and lasting the same number of days each time. Menstruation usually begins between twelve and fourteen years of age and lasts until the woman is forty-five to fifty-five years of age. The late forties are the most usual age for its cessation, which is called the menopause or climacteric, or more popularly is referred to as the change of life.

During the menstrual period a tiny egg, or ovum as it is called, which is so small that it can only be seen with the aid of a microscope, is set free from the ovary and passes down the *fallopian tubes* to the womb. If it meets the male fertilizing agent (spermatozoön) the menstrual flow does not take place and pregnancy begins, otherwise it is discharged from the womb with the menstrual flow.

In addition to the inconvenience caused by the periods, most women experience slight feelings of discomfort before the period begins. They may feel languid, nervy and irritable, and have pains in the abdomen or in the back. Some women are always constipated during a period, whilst others start the period with an attack of diarrhœa; but unless there is some definite reason for it, menstruation must not be regarded as a period of ill-health. It is a perfectly normal function, and for most women entails no stopping of their usual activities. It may be as well to take a little extra care to avoid chills and over-tiredness, but otherwise life should go on much as usual. Some women do not take a bath during the period, but for those who are used to a daily bath it may be safely continued so long as it is restricted to a short warm bath. Cold baths are better done without and sea-bathing should be missed for a few days.

Abnormalities of Menstruation.—Amenorrhœa, Menorrhagia and Metrorrhagia.

Amenorrhœa.—This term is applied to the absence of the menstrual period. In some cases menstruation never begins owing to imperfect development of the womb or other internal organs. This may be rectified by a surgical operation, but not always. It is much more common for the menses to stop after having made an appearance. Chlorosis, or anæmia, accounts for many cases of amenorrhœa in young girls. There may be other causes, such as excitement, shock, mental strain, change of climate, or exposure to cold before or during the menstrual period. It is usual for the menses to make their reappearance after the cause has been removed, even in the case of amenorrhœa resulting from disease. The natural causes of amenorrhœa are pregnancy, the onset of the menopause or change of life, and usually lactation or nursing.

Menorrhagia and Metrorrhagia.—Excessive bleeding at the menstrual period is called *Menorrhagia*, whilst irregular bleeding at times between the periods is called *Metrorrhagia*. Anything over a week is excessive for a period, but many women have periods as long as a week, quite normally, and it is quite common in young girls who usually grow out of the tendency when the periods become established. Certain blood diseases such as anæmia may cause profuse periods. The cause of metrorrhagia or irregular bleeding should always be investigated by a doctor, especially if it comes on in a woman whose periods have previously been regular. All the causes of profuse and irregular bleeding are discussed in the article on FLOODING, which is a general name for the condition. (*See also* CHANGE OF LIFE.)

MENTAL DEFICIENCY is a condition in which the mind has failed to reach a normal stage of development. It is one of the three groups into which all cases of abnormal minds can be divided, the other two being mental

disease (*see below*), and mental decay or dementia (q.v.). Mental deficiency has been made the subject of an Act of Parliament, which states that it is the condition in which an individual is so undeveloped mentally from birth that he is unable to adapt himself to the ordinary requirements of society except under care, supervision and control. There are three grades of mental deficiency: idiocy, imbecility and feeblemindedness, of which the first and the last, being of most importance, are treated under their separate headings. Imbecility is laid down by the Act of Parliament already referred to as the state of those persons in whom there exists from birth or from an early age mental defectiveness not amounting to idiocy, yet so pronounced that they are incapable of managing their affairs or themselves, or, in the case of children, of being taught to do so.

MENTAL DEPRESSION.—Everyone is bound to feel a certain amount of depression at various times when things go wrong. At other times attacks of depression are to be expected such as the depression that so often follows influenza, but these are temporary phases and should wear off. Often gloom is simply a bad habit that the individual has fallen into and will take no trouble to rid himself or herself of. There are, however, unfortunate people in whom depression is a symptom of mental disease, such as anxiety, hysteria, melancholia, hypochondriasis and general paralysis of the insane. For a description of these various states of mental disease see under their own headings and *also* MENTAL DISEASE.

MENTAL DISEASE is one of the penalties of civilization and there is no doubt that owing to the rush and hurry of modern life it is—at any rate in its milder forms—on the increase. The causes of mental disease may be divided into those which arise in the mind itself and have nothing to do with any bodily condition and those which may be traced to some disturbance of a physical nature, either in the brain or elsewhere in the body.

Physical Causes of Mental Disease.—It is only within the last thirty years or so that it has been realized what a very great part infection by germs outside the brain may play in the production of mental disease. Poisons produced by these germs which live in the digestive organs, or in the throat or sometimes at the roots of the teeth, constantly get into the blood and are carried to the brain, and in some people whose nervous systems are not as strong as they might be severe mental breakdowns are caused in this way. The treatment of such patients has been one of the most satisfactory things in mental work of recent years, for, unless the mental trouble has been too long-standing, the killing-off of the germs and getting rid of their accumulated poisons will cure these patients. There are many other bodily conditions which may cause mental disease, and of these the most important are syphilis, alcoholism and disease of the blood-vessels that occurs in old age. Reference to the types of mental disease which may be caused by these conditions will be found under the headings of ALCOHOLISM, DEMENTIA, and GENERAL PARALYSIS OF THE INSANE. Epilepsy too (q.v.), may cause mental disease. In people in whom there is a family history of mental trouble, the two great crises of life, namely puberty and the change of life, sometimes prove too much for the individuals and they escape, as it were, by developing mental troubles. Childbirth also can affect women in this way; but it is exceedingly rare for grave mental trouble to follow childbirth unless there is some definite history of it in the family.

Mental Disease which has its origin in the Mind.—To the ordinary person, mental disease means insanity, but there are a very large number of minor forms of mental trouble which enable people to live amongst their fellows without being regarded as in any way different from them. The victims of these minor mental disorders are never happy people, life is always hard for them; but, unless their difficulties are solved by the right treatment, they go on suffering in silence. These disorders are described under the separate headings of ANXIETY, HYPOCHONDRIASIS, NEURASTHENIA, and PSYCHONEUROSIS. We do not yet know the way in which mental disease arises from the mind itself, but in many cases there can be little doubt that the mental trouble is a form of escape from an unconscious grievance, which once was conscious, and which has made ordinary life unbearable to the patient.

The Chief Forms of Mental Disease not Associated with Physical Disease.—1. *Manic-depressive Insanity.*—In this form of mental trouble, periods of wild excitement alternate

with periods in which the patient is plunged into gloom, like a typical case of melancholia (q.v.). In the depressed stage the condition of the patient is, to all intents and purposes, the same as in melancholia and the same treatment is adopted. The latest view on the subject of this form of insanity is that all cases of melancholia, except those which occur in women at the time of the change of life, go through a cheerful stage in which they are unusually happy and noisy. The alternating periods of happiness and gloom tend to be the same length in the same patient and often the patient himself will be able to name the very day on which the particular period of happiness or despair begins. In the manic stage, these patients are very talkative, noisy and restless. They may talk utter nonsense or are incapable of being understood because their ideas flow too quickly for their tongue to give expression to them. Such patients resent being told that anything is the matter with them, unlike their condition in the depressed stage when they know full well how miserable they are, and often ask to be protected from committing suicide. The interval between the manic and the depressed stage may be a long one, so long in fact that many of these patients are sent home from mental hospitals in between the attacks on the understanding that they return when the symptoms of either stage appear.

2. *Delusional Insanity*.—This is one of the most important, because one of the most dangerous forms of mental trouble; dangerous, because the patient may come into contact with the law before it is realized that he is not responsible for his actions. In delusional insanity, delusions (q.v.) are not only strongly held by the patient, but he justifies their existence and attempts to regulate his life to fit his delusions. A perfect system of reasoning to account for the delusions will be made out, and granted that the original fact was correct, no one could quarrel with the reasoning. Most often the delusions take the form of someone plotting against the patient's life; he says he has secret enemies who try to poison him or to make him mad by calling to him all night. Then very likely he will identify these "secret enemies" with some particular person, his nurse or his doctor, or someone well known, and to protect himself as he thinks, he may make a murderous attempt on their lives. In the early stages of this form of mental disorder patients often make a nuisance of themselves by complaining to the police, or writing letters to the king or to some important official. It is essential that as soon as this type of insanity is recognized the patient should be put under supervision, as such patients are extremely cunning and clever in outwitting their relatives to vent their wrath on the unfortunate victim of their delusions.

3. *Dementia Præcox*.—This form of mental trouble occurs in young people and has been fully discussed under the heading DEMENTIA.

4. *Melancholia*.—This also is referred to under its separate heading.

5. *Acute Mania*.—This type of mental disease best fulfils the popular idea of a "mental patient." Such a patient is unusually happy and a joyous sense of well-being possesses him. Nevertheless, he looks pale and ill and is nearly always thin and anxious looking. Although he is so happy in himself, the little things of life irritate him, and if he is crossed in any way he becomes not only noisy and most abusive, but actually violent, and may injure not only himself, but also his attendants in trying to get his own way. His mood changes in a second from being pleasant and amiable to being blasphemous and violent. He chatters away, mostly utter nonsense, but is very hurt if he is taken no notice of. He wants to do a thousand things at once, but is unable to complete a single simple action. Often he tears off his clothes and destroys every breakable article within reach.

Sleep is almost absent in these attacks—from one to three hours sleep may be all that is obtained without the use of drugs for several weeks.

As a result of this loss of sleep, and also of the extreme activity of the body whilst he is awake, the plight of the patient with acute mania who is not carefully treated becomes a bad one within a very short time. These patients are peculiarly observant and very sensitive to character, and both doctors and nurses hear many comments about themselves from these patients which are more true than polite. In the modern treatment of all mental disease rest finds a prominent place.

but in no condition as much as in acute mania is this essential. Unless a patient with acute mania can be given sleep, he will probably die, so large doses of drugs may have to be given in order to procure him the necessary rest. Another, and more recently introduced, method of treating acute mania is by putting the patient into a very warm bath, above body temperature, and keeping him in it for as long as the condition of his heart will allow. This treatment has a most extraordinary effect in quieting a restless and wholly unmanageable patient.

6. *Confusional Insanity.*—This may occur either in association with bodily disease or without it. At all events, the patient is always examined for evidence of any bodily cause such as alcoholism, bad teeth or tonsils, constipation, before coming to the conclusion that the disorder has its origin in the mind alone. In a state of confusion the patient is lost to himself and his surroundings; he does not know who he is, how he is, or where he is. As a rule these patients look ill; their complexions are muddy and they have coated tongues. Very often they suffer from hallucinations (q.v.) which are generally of an unpleasant nature. They are occupied so much with their hallucinations that they pay little attention to their surroundings and may have to be coaxed or forced to take their food. Confusional insanity is one of the more hopeful of the disorders of the mind, since a large proportion of the patients recover.

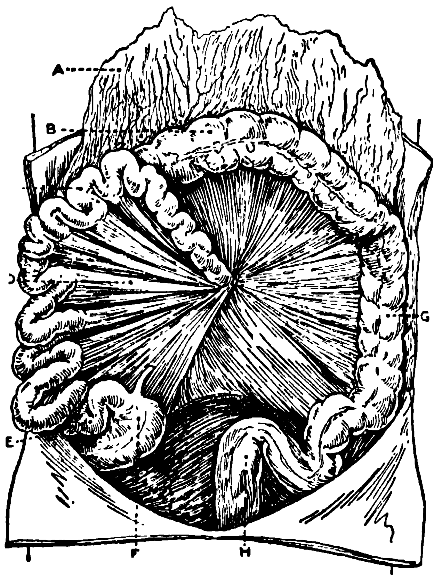
The Modern Treatment of Mental Disease.—In no branch of medicine has so much progress been made during the last fifty years as in the treatment of mental disease. Less than a hundred years ago, the insane were treated like animals; kept alive and fed, but no more. To-day, the modern mental hospital offers every chance of recovery to a patient who enters its doors. The modern system of examining every patient bodily, as well as mentally, has led to the discovery that bodily illness may deeply affect, if it does not cause, many forms of mental trouble, and by the removal of such bodily conditions as may be dealt with by the physician and the surgeon working together, no stone is left unturned in the physical field to account for the mental illness. The mind also is examined by those qualified to deal with it, and any patients who are in a fit state to co-operate with these specialists have every opportunity of discussing their troubles and, by so doing, dispelling them. The way in which mental hospitals in this country are controlled is the admiration of the whole world.

A special Board exists to visit mental hospitals and report on the condition of the patients therein, and any patient is at liberty to see members of this Board in private should he so desire. The patients in mental hospitals are as carefully treated and looked after as patients in any ordinary hospital, and entertainments and sports are always organized to help those who are convalescent to further recovery. The old stigma of being a "certified lunatic" has been largely removed, as any patients who are not actually incapable of understanding their position can now be received in mental hospitals as voluntary or temporary patients. No relative should hesitate to risk the delayed recovery of a person mentally ill because he fears the words "mental hospital." Early treatment in such a hospital holds out the very best chance of recovery a patient can be given.

MENTAL HYGIENE is a matter of education in order to secure that "healthy mind in a healthy body" which makes for happiness. The training of a child in his relationship to the outside world and to his fellow men must be begun at a very early age, and often it is this lack of training of the only child that makes him such an unbearable personality in adult life. It is only natural that an individual should be greatly interested in himself and his own personality, but training and education by his parents should keep him from being wrapped up in himself. The influence of impressions on the childish mind are not sufficiently well realized, and much mental trouble in later life is the result of shocks to the impressionable mind of the young child. Parents who quarrel in front of their children have much to answer for in the results seen by nerve specialists in young adolescents. The fearful tales told by nurses and others to small children may leave marks upon the childish minds which will show themselves years afterwards as unconquerable fears or terrors. The shocks experienced at the dawn of adolescence by both boys and girls who have not been prepared for the normal developments which take place at that period in their lives has driven many a youth

and maiden to self-destruction. Simple instructions would save much misery at this period.

The question of the mating of the mentally unfit is too large a question to discuss in detail, but it may be said that whereas mental trouble on one side of a family may or may not give rise to mental trouble in the next generation, the occurrence of mental trouble on both sides most certainly will. And it has been established that if two people in whose families there is mild mental trouble



Mesentery:
A—Omentum E—Ileum
B—Transverse Colon F—Cæcum, with Appendix
C—Jejunum G—Descending Colon
D—Mesentery H—Rectum

marry, more serious mental trouble is liable to show itself in their offspring. In general, there is very good evidence for the inheritance of at least some forms of mental trouble; thus it would be wiser for those in whose families there is a history of mental disorder not to beget children. At the present time in this country, there is no law enforcing the sterilization of physically or mentally unfit persons. The question of producing mentally or physically unsound children is one which must be left to the public conscience.

MENTHOL.—Menthol is a substance in the form of white crystals which is obtained from certain varieties of peppermint. It is very useful as a local anæsthetic and is put up in convenient forms for rubbing on such neuralgic surfaces, especially in cases such as facial neuralgia where the nerves involved are near the surface. For toothache, menthol may be rubbed on the gums or placed in. the socket of the tooth. The crystals themselves are a very favourite inhalation for colds in the head, sore throats, etc. Put a pinch of the crystals in a bowl and pour boiling water over them. Throw a towel over the head and the steaming bowl and inhale the steam. The eyes should be protected or they may smart.

MERCURIAL POISONING.—Poisoning by mercury may be the result of an attempt at suicide through swallowing one of the many preparations of it, or occasionally it is found amongst persons who work with mercury in the course of making mirrors, thermometers, barometers, etc. In cases where substances containing mercury have been swallowed the mouth will be burnt and the patient will be in great pain; there will also be vomiting and collapse. An ordinary emetic such as salt in water may be given, and restoratives in the shape of brandy in milk to treat the collapse. A doctor will have to be sent for at once. (*See also* First Aid Supplement.)

MERCURY.—Mercury, or hydrargyrum as it is called in Latin, is a liquid metal substance and is very useful in medicine. It is very easily expanded by heat and this property is used to measure temperatures. A small amount is placed in a bulb in an enclosed tube to form the instrument called the thermometer.

It is a very useful remedy in the treatment of syphilis. Many useful ointments are made from it. The favourite powder for infants known as grey powder is a mercury preparation, and so is calomel which has such a powerful effect on the liver.

Mercury is a very powerful antiseptic (perchloride of mercury), and it forms the basis of many lotions, such as black wash.

MESENTERY.—The organs of the stomach are enclosed in a large bag of membrane called the peritoneum. In the peritoneum there are folds called mesenteries which attach the various parts of the tube conveying the food to the stomach to the back wall of the abdomen. There are three of them. One attaching the lower part of the colon (large bowel), one the upper part of the colon.

and the other the small intestine. This latter is the most important of the mesenteries. (*See also* ABDOMEN; INTESTINES.)

MESMERISM.—Mesmerism is an older name for hypnotism, which is the term generally used now. Hypnotism is used in some cases as a method of treatment of diseased mental states such as hysteria. (*See also* HYPNOTISM.)

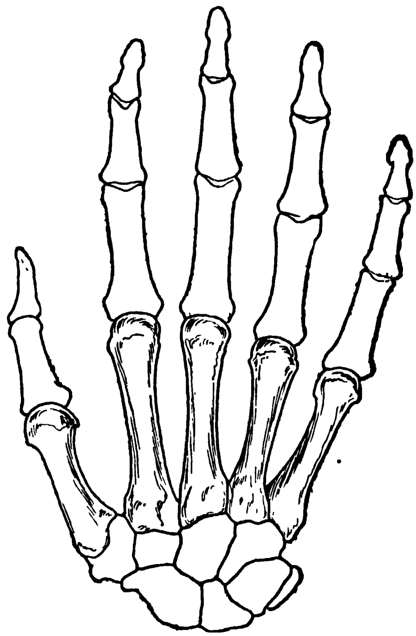
METABOLISM.—By metabolism we mean the various processes by which our food is transformed into substances which are absorbed into the blood-stream and lymph glands for the purpose of nourishing and building up the body, and the waste materials are abstracted from the food ready to be discarded from the body. In this process the various organs of the digestive tract play a large part together with the ductless glands. Certain diseases are called disorders of metabolism, such as diabetes, gout, myxœdema and obesity. (*See also* BLOOD; DIGESTION; DUCTLESS GLANDS; and the SPECIAL SUPPLEMENT ON DIET.)

METACARPUS.—The metacarpal bones are the five bones in the palm of each hand to which the fingers are attached. When the hand is closed the ends of the metacarpal bones can be felt as the knuckles. The metacarpal bone of the thumb is shorter than the other metacarpals, but has a much larger range of movement. (*See also* FINGER; HAND.)

METASTASIS.—By metastasis is meant the spread of disease from one organ to another. Cancer spreads by metastasis.

METATARSUS.—The metatarsus is composed of the five metatarsal bones of the foot. (*See* diagram on page 356.) The metatarsal bones are the bones in the main part of the foot to which the five toes are attached. The ends of the metatarsal bones form the ball of the foot. (*See also* FOOT.)

METCHNIKOFF.—Elie Metchnikoff was a Russian biologist who died in 1916. He made some very important contributions to medical science, of which the theory of *phagocytosis* is the most important. In his work he noticed that in every form of animal there is one sort of cell in the blood which has the power of seizing upon foreign bodies in the blood and surrounding and destroying them by a process which resembles eating them up. These cells are called phagocytes, and the process by which they destroy the invading germ or other foreign body is called phagocytosis. At the point where the germs have attacked the body and the phagocyte army is gathering in force to fight them, the condition we call inflammation arises. If the phagocytes are in good fighting trim they destroy the invading germs with great rapidity and the person is none the worse. Such a person is said to be immune to the disease. If they are not so strong, then there will be local inflammation. Immunity can be acquired by vaccine treatment.



Metacarpal Bones (other bones in hand in outline only)

Metchnikoff's name is associated by most people, however, with sour milk, which he used as an aid to the cure of certain diseases. This form of treatment is still very much in vogue and has become a recognized part of medical treatment. He knew that sour milk products formed an essential part of the diet of people in many countries, and as the germ which turns milk sour is able to fight decay, he conceived the idea of treating poisoning of the system by the poisons formed by decaying matter in the intestine (intestinal toxæmia). He fed his patients with milk containing the milk-souring bacillus, thus introducing the bacillus into the food tract to fight the germs which cause the

decay. In some forms of intestinal poisoning this treatment gives very good results.

METHYL SALICYLATE.—Methyl Salicylate, or artificially made oil of wintergreen, is of the greatest use for the treatment of rheumatic and other pains. It is easily absorbed through the skin, and can be used either as a liniment or more frequently as an ointment for rubbing in. It has a very characteristic odour. (*See also* GAULTHERIA.)

METHYLATED SPIRIT.—Methylated spirit, a mixture of nearly pure alcohol and wood-naphtha, is not now allowed to be sold in a pure form because of the use that was being made of it as an intoxicant. In the mineralized form in which it is now sold for domestic purposes it is very unpalatable and not so likely to lead to people becoming addicted to the drinking of it. The effects of drunkenness from methylated spirits are of much longer duration and more quickly serious than those of ordinary alcohol. Also, they take much longer to become apparent. The results of drinking the spirit may not come on for three or four days after it has been drunk. On the other hand, alcoholic blindness may come in twenty-four hours after drinking methylated spirits and may be permanent. Methylated spirit in the form known as surgical spirit, is of the greatest use in surgery for the disinfection of instruments, avoidance of bed-sores, etc.

METRITIS.—Inflammation of the wall of the womb is known as metritis. It is caused by many things. Too frequent pregnancies, childbirth late in life, the condition known as subinvolution of the womb, gonorrhœa or any inflammation of the womb may cause metritis. It is one of the commonest causes of the condition known as flooding in which there is severe loss at the periods, and in some cases the loss as the change of life comes on may be almost continuous, and may cause severe exhaustion and anæmia. In its early stages, rest in bed may cure it, together with hot douching and the appropriate medicines which would be prescribed by a doctor.

METRORRHAGIA.—Irregular bleeding from the womb. (*See also* FLOODING; MENSTRUATION.)

MICROBE.—A microbe is a germ. The word microbe literally means a small living thing. Micro-organisms, bacteria and bacilli are other names for microbes. (*See also* GERMS.)

MICROSCOPE.—A microscope is an instrument which magnifies small objects very greatly. Without the microscope we would know nothing about the germs of disease, blood cells and many other minute things which are of the utmost importance to our health. They can only be seen by high-powered microscopes, and scientists are led to believe that there are many other germs which have not been discovered yet simply because no sufficiently powerful microscope has been yet invented to see them. The germ of measles, which almost certainly exists but has not yet been seen, may be one of these ultra-microscopic germs.

MICTURITION.—By micturition is meant the act of passing urine. The surplus water from the body is withdrawn from the system by the kidneys and is then passed on to the bladder, where it is stored up for some hours at a time until the bladder is full, when the nerves in the wall of the bladder send a signal to the nerves of the muscle of the bladder wall which contracts and expels the urine. In babyhood the action is purely reflex; that is, when the bladder is full it automatically empties itself, but as this would be very inconvenient in later life we train ourselves to make the action of emptying the bladder a voluntary one. If the call to empty the bladder is received at an inconvenient time we can wait our own time to perform the act of micturition. Certain diseases may upset control temporarily. Some children are very backward in learning control, and mentally deficient people may have little control. (*See also* BED-WETTING; BLADDER, DISEASES OF.)

MIDDLE EAR.—The inner part of the ear between the drum and the passages leading to the nose is called the middle ear. Inflammation of the middle ear is called *otitis media*. For a full description of the ear *see* EAR.

MIDRIFF.—An old-fashioned name for the diaphragm and it is described under that name.

MIDWIFE.—A midwife is a woman who attends upon another woman in her confinement. Since 1908 it is compulsory for any woman who practises midwifery for gain and as a profession to be trained to pass an examination and be subject to inspection. She puts the letters C.M.B. after her name,

signifying that she has received a certificate from the Central Midwives Board. An untrained woman may of course assist at a confinement in an emergency when there is no trained help to be had.

MIGRAINE is a form of nervous headache (q.v.) which occurs periodically. There is some evidence that it runs in families, and if a mother is subject to these headaches then it is very likely that her children will also suffer from them. The word "migraine" comes from a French word meaning "one side of the head" and in many of the attacks of migraine the headache is felt either on one side or the other, though this is not an invariable rule. Every person who suffers from migraine has his or her own particular form, but generally speaking the sufferer awakes in the morning feeling as if he is "in for it." The headache is often the last thing to occur, and the unfortunate victim may wonder what is the matter with him until he realizes that his trouble is only migraine.

Odd things seem to happen: bright lights which jump about and then form weird patterns are seen, or the patient may suddenly only see half of everything he looks at, or he may see coloured flashes. Then perhaps he may find it difficult to think clearly, his words will not be pronounced as he wishes; he may say them backwards or jumble them up, so that his speech is impossible to understand. Another queer thing may happen; he may get "pins and needles" all up one side of his body and face. Then the headache usually starts, and it may vary in different attacks from a dull ache at the back of the head to such a severe throbbing that the patient is unable to lie down, sit up, or find any position which relieves his pain.

After a period, which may vary from half an hour to a day or more, the headache stops, either after the patient has been sick, or after he has slept. Most people who suffer in this way find that if they can sleep they awake free from headache, though feeling weak and "washed out," as though they had had a sleepless night. Not all the things that have been described will happen in any one attack of migraine; but any of them may be the only sign of the condition. Of all the symptoms, the headache which occurs at intervals is the most constant. It is important to state here, that whilst migraine itself is a common, annoying, but harmless disorder of the nervous system, there are grave disorders of that system—one being tumour of the brain, which may mimic the symptoms of migraine very closely—and it is necessary to have expert advice before saying that any severe headache which occurs with sickness is "just migraine." Most cases of true migraine start at a very early age; the subjects of it are liable to "bilious attacks" in childhood and after puberty the headaches seem to take their place.

No one cause has been found for this disorder. Many things are known which will bring on an attack in anyone who is subject to the attacks. Excessive tiredness, either bodily or mental, is a well-known cause. Certain articles of diet such as too many sweets, or rich pastry, or fruit will bring on an attack in others. Eye-strain, infection of the back of the nose and of the tonsils has been known to produce frequent attacks which were lessened on removal of these causes. Certain emotions, especially rage or humiliation which the subject could not at the time express for fear of the consequences, have often been shown to bring on attacks.

Treatment.—Prevention of the attacks amounts to discovery of the particular cause in a particular case and the treatment thereof. In the attack itself little can be done for the victim except to leave him, or her, in a darkened room which has been selected for its quietness and to let him lie or sit in whichever position gives the most relief until sickness or sleep relieves his pain. No one drug has been found to suit every case of migraine. It may be necessary to try several before one is found which will ward off or shorten an attack. In general, it is easier to ward off the attacks by means of drugs than to shorten or relieve an attack once it has started. (*See also* HEADACHE.)

MILIARIA.—Miliaria is the very common condition known as sweat rash or heat rash. It is also called sudamina. A description is given under the heading SWEAT RASH.

MILIARY TUBERCULOSIS.—This is a severe form of the disease in which the tuberculosis spreads rapidly throughout one or more organs of the body and tiny hard lumps which are said to resemble millet seed (whence comes the name) are found in the various organs affected, most commonly the lungs. (*See also* TUBERCULOSIS.)

MILK.—There is only one food so far as we know on which it is possible to live solely for any length of time—milk. An adult doing hard work would need, it is said, over a gallon daily; it is not therefore a convenient form of sustenance, nor one likely to be adopted as sole diet to any great extent.

Milk is regarded as the only form of animal food containing all the constituents necessary to the perfect food—protein, fat, carbohydrate and salt in sufficient quantity.

Mother and Baby.—The principal differences between cow's milk and human milk are that there is too much casein in cow's milk and not enough milk sugar; this is one reason why the mother's milk is the perfect food for her baby. The curd of cow's milk forms larger lumps than the natural milk, and the infant's stomach cannot deal with it. Diarrhœa and other digestive disturbances may easily result from undiluted cow's milk.

Milk is the natural food of babies. As every mother knows now—for doctors and nurses, welfare centres and clinics, have preached it for years—it is the mother's duty to feed her baby herself if she can do so, and personal convenience should never be allowed to stand in the way.

At the welfare centre the mother learns, before her baby comes, how to care for her own health so that the milk will come readily and the supply be kept up. She learns the value of good nourishing food for herself, the need for comfortable clothing, fresh air, exercise, and for avoiding worry. She learns the importance of good and regular habits for herself and her infant, of four-hourly feeding and no night feeds, and judging the baby's nourishment by regular weighing.

The Baby's Bottle.—If it is necessary to feed by bottle, and later, when the teeth begin to appear and when weaning becomes due, the question of the milk used is of vital importance. It is usual to give cow's milk with water and a little cream and sugar; to start with, about twice as much water as milk is used, the proportions being altered gradually until all milk is given. Some maternity welfare workers recommend barley-water in place of plain water, and brown sugar, a teaspoonful with each meal. (*See also* SUPPLEMENT ON BABY at the end of this book.)

Milk for Children.—For the growing child, milk continues to be a necessary food unless for some reason it cannot be taken and some substitute has to be found. We hear a great deal about vitamins, but as a rule people have a very vague idea as to what they are. These food substances are of great importance, and it is plain that food, if it is to nourish us, must be the right kind of food and not merely what we happen to fancy. Among children, especially, much ill health is due to the wrong kind of food, and this applies to milk, which may be too poor in quality or too small in quantity for the growing child. Especially when signs of rickets show themselves, as they do in some children, generally about the sixth month or a little later, the question of milk becomes of supreme importance. While it is true that fresh air and sunshine play an important part in preventing this disease, the amount of fat and the presence of vitamins in the child's food are of great importance also. In these cases, a pint and a half of milk a day is not too much, and cream may be given in it, as well as sugar and a small quantity of salt. Milk puddings too may be found of value, and at the end of the first year of the child's life it may be taking as much as two pints of milk with cream as well as other foods.

Milk in Illness.—Just as milk is the best food for children while their stomachs are weak and their digestion easily upset, so it is of great value when the adult's digestion is disturbed by illness. But not everyone can take milk alone; in such cases it may be found useful to add a little sugar, or a pinch of salt, while soda water or lime water often prevents indigestion. A little citrate of soda may help to avoid acidity. Plain water is too apt to produce diarrhœa and other digestive troubles.

Those who have to consider the diet of consumptives sometimes give cream instead of cod-liver oil, if it is liked, remembering that food which is liked by the patient is more valuable than that taken unwillingly and without relish, and that variety is very important.

A separate cup should be kept for the invalid's milk, and it is a good plan to stand it in cold water between the times of using it. It is helpful when the patient likes milk.

If a block of ice is to be had, it is well to stand the jug of milk on it, when it will keep

longer, or the jug may be put in a basin containing water with salt in it. A wet piece of butter-muslin over the jug, with the corners lying in the salt and water, is a good way to keep milk fresh.

Milk as Disease Carrier.—Milk is perhaps the greatest disease carrier we have, hence the great importance of being certain that the daily supply comes from healthy cows cleanly milked, and that it is conveyed to the purchaser in properly sterilized bottles. In an up-to-date dairy the process of preparing both milk and bottles for the consumer is somewhat as follows:

The bottles brought in from the previous round are put into a cylinder, round which they circulate, being subjected first to cold water, then to warm, then hot; a caustic solution is used in the process to cleanse them thoroughly, and by way of warm and cold water they return to the front of the cylinder and are removed for refilling.

The milk brought in from the farm, or farms, is poured through a strainer into a large tank. It then passes by pipes up to the cooler, over which has been passed first water and then brine; in its cooled state it is filled through taps into the bottles, and these are at once sealed with a cardboard cap.

The officially recognized grades of milk are:

(1) *Certified Milk.*—The cows must be inspected every six months for tuberculin, milked under clean conditions, the milk cooled immediately and put into bottles closed by a cap which forms a seal; the cap has on it the address of the farm, the date of milking, and the words "Certified Milk." It is delivered direct from the farm, which is responsible for its purity.

(2) *Grade A (tuberculin tested) Milk.*—The conditions are the same as above; but the milk is sent to the dairies to be bottled and delivered to the consumer.

(3) *Grade A Milk.*—From a herd which is examined every three months by a veterinary surgeon, but not necessarily tested for tuberculin, and not delivered to the consumer sealed.

(4) *Pasteurized Milk* is milk raised to a temperature below boiling point, kept at this heat for half an hour, and immediately cooled.

If there is any doubt about the source of the milk, and no change can be made, it may be boiled, with the object of destroying any harmful germs that may be in it, but boiled milk is not quite so nutritious.

Sterilizing the milk prevents fermentation and delays decomposition. It is done by bringing the milk to boiling-point, keeping it at this heat for a quarter of an hour, and then sealing it hermetically.

Curdling the milk with rennet may make it more palatable to some people.

Other forms of milk preparation are drying, condensing, peptonizing, and humanizing. Dried cow's milk diluted with water forms a curd in the infant's stomach more like that formed by the mother's milk than that formed by untreated cow's milk, being in smaller lumps; doubtless for this reason some infant welfare centres provide it for mothers who cannot nurse their infants, or to supplement the mother's milk. Condensed milk is also sometimes used for infants where the mother cannot nurse; great care should be taken in choosing the right brand; some must, by regulation, be marked as unfit for babies. By peptonization the milk is partly digested before being given, thus making the process of digestion easier. Humanized milk is treated so as to make it as much like the mother's milk as possible. (*See also* FOOD; SUPPLEMENT ON DIET AND INVALID COOKERY at the end of this book.)

MILK FEVER.—Milk Fever is the popular name for an attack of feverishness coming on in the mother about the second or third day after the birth of a child. It used to be very common, and was usually put down to nervous and constitutional upset caused by the first coming of the milk to the breasts, hence the name. It is now known, however, that these fevers were really caused by infection in some part of the genital tract. Milk fever has become much rarer since more aseptic methods have been used at the time of labour and since women have been taught to prepare and harden the breasts beforehand so that they will not become cracked and sore when they are first used. (*See also* PREGNANCY.)

MILK SICKNESS.—An acute form of poisoning which is found in some parts of America is attributed to the consumption of milk, butter or cheese made from the milk of cattle which are suffering from the cattle disease popularly called "the trembles." The patient becomes seriously ill with tremors

in the limbs and perhaps convulsions. There is intense pain and vomiting. The treatment is the same as for other forms of food poisoning, but as muscular exertion tends to bring on the tremors, the patient, during the convalescence, should be as quiet as possible.

MIND.—The result of our thoughts and feelings which have been built up by our training and experience. The higher development of the mind is, of course, what removes us above the highest of the animals, the apes. At birth only one primitive instinct is present in the human child, as in all other young, namely, the instinct to preserve its life by acquiring food, which it does by the process of sucking. Later, the selfishness of the child, whose only interest if left untrained would be in himself, is replaced as a result of education and training by more desirable qualities which make the individual a fit member of society as it exists to-day. But all memories of every experience which have affected a person during his life are stored up in the mind. Some of these memories consist of thoughts which can be recalled at any given time; these thoughts form the conscious mind. Other experiences or thoughts which have resulted from them are forgotten, either owing to lack of interest or because they were painful and unpleasant. The former may be recalled to the conscious mind easily by a little concentration on the circumstances of the forgotten memories by the person, but the painful or unpleasant memories and ideas are "locked up," as it were, and can only be recalled with the greatest of difficulty and usually only by the help of psycho-analysis (q.v.).

The mind is like a room with a number of cupboards. Most of these cupboards are open and we can look inside: these cupboards represent the conscious mind. Then there are some cupboards which are closed, but which we can easily open by a little probing about to turn the handle, and we have a vague idea what we shall find in these cupboards when we have opened them. These cupboards represent the subconscious mind. Lastly, and perhaps most important of all from the point of view of mental disease, there are the locked cupboards, guarded by a sort of caretaker called the censor, who sees to it that these cupboards shall not be opened if he can prevent it. We are quite unaware of the thoughts that are stored up in these locked cupboards unless by some accident, or by means of psychotherapy, we are able to beat the censor and unlock the cupboards. These locked cupboards represent the true unconscious mind in which are stored up all those unpleasant and painful memories which are associated with the training of a child to fill his proper place in our present civilization.

It has already been mentioned that the first instincts of a child are purely selfish, and although as a result of training, these instincts have been pushed back into the unconscious mind, they do not submit tamely to this process of what is called "repression," which means a "pushing back." All the time these selfish instincts are struggling to overcome that censor which is keeping them locked away, and in dreams, to a certain extent, they succeed in outwitting it, appearing in a distorted but recognizable form. Under certain other circumstances the censor loses much of its power and then these primitive instincts are able to escape into the conscious mind. In drunken people, behaviour is often seen such as would be expected only from an untrained child; this is due to poisoning of the most highly developed nerve cells, and so the censor is eluded. In poisoning by other drugs, such as morphia or cocaine, much the same sort of thing happens, with the same result: behaviour becomes that of a selfish child.

Sometimes these instincts elude the censor for a short time by means of the day-dream. There are few people who have not at one time or another allowed themselves the luxury of letting their imaginations have free play to succeed in everything in life, especially in those things in which they have failed in real life. Normal people, however, realize that they are day-dreaming and can shake themselves out of their day-dream when it is necessary for them to return to the realities of the real hard world. But certain folk are unable to do this and prefer to keep their day-dreams and banish reality from their lives: they retire into themselves and live a life of their own which has no relation to the outside world. This is one of, and perhaps the most likely, explanation of the mental disorder, dementia præcox. The time at which this disorder usually comes on, in late adolescence or early adult life, is just the time when life is beginning to be

really difficult for the great majority of people as they have to take their right place in a not too kindly world. Certain people withdraw mentally from this world and live in a world of their own which is kinder to them. We call them cases of dementia præcox and try to get them back to reality, but they are satisfied to remain in their own world and refuse to return to mental reality.

Normal people direct the energy, which is caused by the primitive instincts in the unconscious mind struggling to make themselves felt, in a useful way; most of the arts, such as music, painting and literature, provide an outlet, as it were, for this unwanted energy. Games also, especially in the young boy or girl, are excellent means by which this energy can be side-tracked into useful channels. There is much to be done in the treatment of nervous and mental disorder along the lines of providing some kind of outlet or means of utilizing this stored-up energy. If this happy result of transforming the energy of the primitive, socially objectionable instincts into useful activities is not attained in normal people, then what is called a "conflict" is caused, and this gives rise to much mental trouble of a more or less serious nature, according to the particular individual in whom it occurs. The influence of the bodily health on the mind in such cases is of great importance, and it is absolutely necessary that in any case which shows signs of nervous or mental trouble the physician should be consulted before a person condemns himself as a victim of "nerves" and becomes more and more wretched in consequence. The majority of physicians now practise psychotherapy and are therefore in a position to treat not only the bodies but the minds of their patients. (*See also* MEMORY; MENTAL DISEASE; MENTAL HYGIENE.)

MINERAL WATERS.—Practically any water can be described quite accurately as a mineral water; but, as a general rule, the term is used to apply to waters specially bottled at some health resort because of the extra amount of some mineral they contain. Some waters have extra amount of iron, sulphur, arsenic or calcium in them which makes them specially suitable for different complaints. Every mineral water does not necessarily suit everyone, which is a mistake that is too often made. For instance, at some spas the water is definitely bad for people with certain stomach complaints, etc., and some spa waters are inclined to be constipating whilst others are loosening in their action. For this reason most spas insist on the patients being examined by a doctor attached to the spa before treatment is begun. (*See* BATH.)

MINER'S ANÆMIA.—*See* HOOKWORM DISEASE.

MINER'S ELBOW.—Constant friction or pressure on the little bag of fluid called the bursa at the back of the elbow causes a chronic swelling or bursitis. This is popularly called "miner's elbow." A similar condition on the knee is called "housemaid's knee." Tennis elbow is another common form of bursitis. (*See also* BURSITIS.)

MINER'S NYSTAGMUS.—A condition sometimes found in miners in which the eyeballs turn from side to side. This causes poor sight and often nervous troubles. It is thought that the dim light in which the miner works may be the cause. (*See also* NYSTAGMUS.)

MISCARRIAGE.—If a pregnancy terminates before the baby is old enough to have a separate life, that is before the 27th week of the pregnancy, there is said to have been a miscarriage. (*See also* ABORTION; CHILDBIRTH; PREGNANCY.)

MITRAL VALVE.—The mitral valve is the valve between the two left chambers of the heart. It is supposed to resemble the shape of a bishop's mitre. The mitral valve may become narrowed or may not work properly, in which cases there is said to be mitral disease of the heart. (*See also* HEART.)

MIXTURE.—Any two or more liquids added together and well mixed for the purpose of being swallowed as medicine can be called a mixture, or mistura. The typical mixture as prescribed by a doctor will consist of two or more drugs, with a quantity of water to dilute them to a strength at which they can be safely swallowed, and a flavouring matter. Sometimes a colouring matter is added as well.

MOLAR.—The molars are the back teeth with which we grind our food. (*See also* TEETH.)

MOLE.—A mole is a birthmark in which there is a tumour in the skin containing the brown colouring matter of the skin in

excessive quantity. Sometimes the mole will be covered with hair as well. (*See also* BIRTH MARK; SKIN.)

MONGOLISM.—This is an unfortunate severe type of mental deficiency with which a child is occasionally born. It is called Mongolism because the child has the square face and upward slanting eyes which are characteristic of the Mongolian race. It is not known what causes mongolism; but the child is usually the last of a large family, and it is surmised that the mother's powers of reproduction have become impaired. It is important to distinguish Mongols from cretins, because the cretinous child can be turned into a practically normal human being by suitable medical treatment, whereas there is nothing much to be done for the little Mongol child beyond caring for it in as kindly and sympathetic manner as possible. Their mentality remains that of a young child; but they are usually happy, cheerful and affectionate people and easy to get on with. (*See also* MENTAL DEFICIENCY.)

MONK'S-HOOD.—Monk's-hood, which is also called blue rocket or wolf's bane, is a common plant in English gardens. It contains a deadly poison called aconite, and if any poisoning should occur by it, measures must be taken at once to deal with it. Vomiting must be induced by an emetic and the patient must be given stimulants and be kept absolutely still, as death may occur after a sudden movement. (*See also* POISONS in the FIRST AID SUPPLEMENT.)

MONOMANIA is a form of insanity in which the patient's whole interest is centred round one delusion, or false belief. Nothing else can really interest him but that one particular delusion, but he will not readily communicate that delusion to one who is not prepared to sympathize with him. Some of these patients attempt to build their lives round their monomania. For example, one lady will spend all her time preparing to take her place as the future Queen of England. Any doubts cast on her right to be so honoured are treated with the resentment they deserve! Apart from this one delusion, such patients may be perfectly reasonable and charming people, but they are difficult to deal with because they become abusive and even violent if their monomania is questioned. (*See also* DELUSION; INSANITY; MENTAL DISEASE.)

MONTHLY SICKNESS.—Monthly sickness, periods or courses are all ways of alluding to the natural process of menstruation under which heading the process is described.

MORBUS.—Morbus is a Latin word meaning disease. It used to be the habit to call all disease, drugs and medical things in general by Latin names and heart disease, for instance, would be called morbus cordis. The adjective from morbus is morbid, which is still used sometimes to mean diseased.

MORNING SICKNESS.—One of the very earliest signs of pregnancy is morning sickness which is a slight attack of nausea or actual sickness on first rising from bed in the morning. In most women it is nothing more than the bringing up of a mouthful of clear fluid, but in different women it differs very much. Some women feel nauseated and sick all day; others have such disturbances as constipation, flatulence, profuse watering at the mouth, etc. The condition lasts until about the end of the third month of the pregnancy. It is supposed to be nothing more than the slight reaction of the nervous system to the new order of things, and needs no treatment or especial consideration as things will adjust themselves in due course. If the nausea should be bad, however, and it is certain that it is not the result of nervousness on the part of the patient or encouraged by undue fussing on the part of her friends, it is obvious that a doctor should be consulted as it is quite possible for a pregnant woman to be suffering in addition from any of the many forms of physical illness which afflict mankind, and it is not rare, by any means, for conditions such as appendicitis to make their appearance for the first time during pregnancy, and if such a misfortune should occur to the pregnant woman the sooner it is attended to the better. The urine should always be examined at intervals if there has been undue sickness to avoid the condition known as *eclampsia.* (*See also* CHILDBIRTH; PREGNANCY.)

MORON.—A moron is a person of little sense. In America it is used to denote the highest grade of mental defective, and that use of the word is becoming popular in this country too. It is equivalent to our use of the word feeble-minded. (*See also* IDIOCY; MENTAL DEFICIENCY; MENTAL DISEASE.)

MORPHIA.—The name morphia is applied popularly to morphine and the drugs derived

from it. It is an alkaloid obtained from opium and its effects are much the same.

Morphia, used properly, is one of the greatest blessings that have been granted to the human race. It is the greatest of all pain-killers. To obtain the best results it is usually given by hypodermic injection. The chief characteristics of morphia are that it speedily relieves pain and produces drowsiness or sleep, it acts on the nerves of the intestines, produces constipation, and it soothes the respiratory system. It is used in order to allay severe pain, to aid in arresting severe bleeding by keeping the patient quiet, to control severe diarrhœa; also various derivatives from it such as heroin or chlorodyne are used to soothe severe coughing.

Although the uses of morphia are so many and when properly used so beneficial, it is unfortunate that it is very much abused. The taking of morphia very soon becomes a habit and a craving is developed for it which the victim will stoop to any depths to satisfy. (*See also* DRUG HABITS; OPIUM.)

MORPHINE.—*See* MORPHIA.

MORPHINISM.—Chronic poisoning by morphia and the development of a craving for morphia are known as morphinism. (*See also* DRUG HABITS; MORPHIA.)

MORTIFICATION.—The mortification of a part of the body means the death of that part by gangrene. (*See also* GANGRENE.)

MORTON'S DISEASE.—This is the name given to a condition in which there are severe neuralgic pains shooting down from the ball of the foot into the toes. It is caused by the dropping and flattening of the arch of the foot which results in pressure being put on the nerves where they pass into the toes. The condition is also known as metatarsalgia from the fact that the pain is in the region of the metatarsal bones of the foot. The treatment for this pain is to obtain proper support for the transverse arch of the foot by specially fitted boots which are wide enough at the toes and have low and broad heels. Exercises and massage may be helpful in restoring the arch of the foot. They should certainly be tried and persevered in. (*See also* FOOT, REMEDIAL EXERCISES, in the SPECIAL SUPPLEMENT ON EXERCISE.)

MOSQUITO.—There are more than a thousand different species of mosquitoes, but only a certain number of these are responsible for carrying the germs of malaria. The female insect is the germ-carrier and she is the blood-sucker, as the digestion of blood helps her eggs to mature. Mosquitoes cannot become dangerous unless they themselves become infected by biting a patient suffering from malaria. In this way we are comparatively free from the disease in this country, though there are many mosquitoes which cause blood poisoning and other symptoms as a result of their bites. Several species of mosquitoes convey dengue and yellow fever, and others have been proved to carry the small worms called filaria bancrofti, which cause the condition known as filariasis. The female mosquito lays her eggs in stagnant water, and great masses of eggs may float together until the hatching process commences. It takes two to three days for the larvæ to appear, and they are very small and transparent and are popularly known as wrigglers. The larvæ lie just below the water and they have a tail-like breathing apparatus which penetrates the surface. They spend three weeks to several months in this stage and then they develop into the pupa stage. After a few days the insect emerges from the pupa case, on which it stands until its wings are sufficiently dry to allow it to fly; and, under suitable circumstances, a mosquito may live for several months.

When the importance of the mosquito in relation to disease was fully realized, steps were taken to abolish their breeding grounds, and from their life history it can be quite realized that several methods could be very effectively carried out. The permanent cure of killing the larvæ is carried out by pouring oil on the surface of the water, thus choking up their breathing tubes. Stagnant pools may be drained, or the mosquito can be prevented from breeding on its surface by creating a flow of water or making a tidal wave.

In the matter of warding off insects, oil of citronella, oil of bergamot, cloves, thymol or cassia may be smeared over the exposed parts of the skin, which seems to have a certain amount of success. In the tropics, certain precautions must be taken to guard against their bite. It is important to see that all possible inlets to a house are adequately covered with netting. (*See also* BLACKWATER FEVER; FILARIASIS; MALARIA.)

MOTIONS.—It is usual to talk of the evacuations of the bowels as motions. (*See also* Stools.)

MOTOR AREAS.—Our movements which we perform deliberately are caused by discharges of energy from cells in a region of the brain which is known as the motor area, meaning the area which deals with movement. For a full description of the mechanism of the brain *see under* the heading Brain.

MOUNTAIN SICKNESS.—People who go from a lower altitude into the mountains are liable at first to be overcome by attacks which are called mountain sickness. There may be a feeling of great muscular weakness, bad headache and a necessity to gasp for air. Sickness or nausea are also frequently present. Mountain sickness is caused by the diminution of the quantity of oxygen in the air at higher altitudes, and it is therefore common amongst aviators who go up to great heights. People who go to live in the ordinary inhabited mountainous regions such as Switzerland often feel the mountain sickness at first but they become acclimatized after two or three weeks. In the case of the attempts to climb the highest mountains in the world, such as Everest, it is the question of the lack of air suitable for human beings to breathe that has hitherto made it impossible to reach the summits. Special respirators have been invented to make breathing possible at great heights.

MOUTH.—The mouth is generally considered in two parts. The *vestibule* or space between the lips and cheeks and the teeth and gums, and the mouth proper, which is the large cavity between the teeth and the throat. Above, the mouth is bounded by the hard palate which merges into the soft palate at the back of the mouth. The tongue lies on the floor of the mouth, which contains the blood-vessels and glands which pour the saliva into the mouth. The whole of the mouth is lined by mucous membrane. The various parts of the structure of the mouth—the teeth, tongue, lips, jaws, etc.—are described under their own headings.

Inflammation of the mouth is called *stomatitis*; inflammation of the tongue is *glossitis*, and inflammation of the gums is *gingivitis*. The mouth is subject to ulceration from such causes as a jagged tooth, neglected stomatitis, etc. Various infectious diseases such as measles and chicken-pox can be diagnosed by the appearance of rashes in the mouth.

As the whole food supply of the body passes through the mouth it is obvious that it should be kept perfectly clean and in good health.

A septic condition in the mouth, either from the teeth or the tonsils, will almost invariably cause trouble further down in the digestive tract.

MOUTH-WASH.—It is useful to have a mouth-wash handy and to occasionally give the mouth a good rinse out and gargle in addition to the usual teeth-cleaning operations. Common salt, bicarbonate of soda, boracic acid, glycothymoline, potassium chlorate or hydrogen peroxide are all very useful mouth-washes, and there are many variations put up in handy form in tablets for dissolving in water. When the breath is bad the mouth may be rinsed with a solution of permanganate of potassium, dissolving a few of the crystals in water just enough to make the solution red.

MUCO-PURULENT.—This is an adjective meaning a mixture of mucus and pus (matter). The discharge from the nose in the later stages of a bad cold is often muco-purulent, as will be seen from its yellowish colour.

MUCOUS MEMBRANE.—The linings of various organs of the body are moistened with the sticky substance called mucus and are called mucous membranes. The organs of the digestive system, of the breathing apparatus, and the genito-urinary passages are the chief regions lined with mucous membrane. Any inflammation of a mucous membrane increases the flow of mucus and causes the condition known as catarrh. (*See also* Catarrh; Membrane.)

MUCUS.—Mucus is a sticky, slimy substance which is poured out over the mucous membranes which line various organs of the body. It serves as a protection from friction and also protects the delicate membrane from too easy attack by germs. Thus when anything irritates the mucous membrane a greater flow of mucus than usual is poured forth. The saliva contains a large amount of mucus which serves to bind together the food into a mass ready to be swallowed. In the stomach and the intestines the mucus also serves this purpose of binding the contents

in order that they may be more easily propelled along the digestive tract. (*See also* CATARRH; COLITIS; MUCOUS MEMBRANE.)

MUD BATH.—Mud baths are useful in certain forms of chronic sick disease and in rheumatism of the muscle and joints. The various sorts of mud used contain different substances which are brought into close contact with the skin by applying the mud in a thick layer to the joint or part of skin to be treated. This mud poultice is kept on for from twenty to thirty minutes and is then removed and the part bathed in ordinary warm water. The hot volcanic mud of New Zealand is supposed to be particularly curative and is exported to England in powder form and can be obtained as a bath at various spas. At Bath the mud is found on the hills nearby in the form of Fuller's Earth and is said to be very soothing

MULTIPARA.—A woman who has had more than one child is called a multipara.

MULTIPLE NEURITIS.—Neuritis occurring in more than one nerve at the same time is called multiple neuritis. It is of course an extremely painful condition, and is usually the result of some poison which is circulating in the blood, or of a chronic disease such as diabetes. Chronic alcoholism is often accompanied by multiple neuritis. People who work with lead or arsenic also get it frequently. (*See also* NEURITIS.)

MUMPS.—Mumps is one of the commonest of the acute infectious diseases. It is more common in childhood than amongst adults, but is apt to cause more distress to grown-up people when they do get it. It is very infectious, and the danger of infection is not over for a fortnight to three weeks after the symptoms appear; then the *incubation period* is also up to three weeks, so no household that has had a case of mumps is safe from it until nearly six weeks have elapsed. As it is extremely difficult to get people, especially children, to remain in isolation for that length of time, it is often found that a second case occurs in the same household when it has been thought that all danger was over for some weeks.

Symptoms.—The usual fever symptoms are present, raised temperature, up to 100° or higher, being the rule. The most characteristic symptom, however, is the swelling of the glands of the neck under the ear and perhaps under the chin. These are the parotid glands and the submaxillary glands. The swelling and soreness begin on one side and after a few days usually spread to the other side of the face as well. The worst points of tenderness are about the ear and under the edge of the jaw. The swelling may be immense and there may be a great deal of pain, though as a rule the patient does not become as sick and feverish as in some of the other fevers. Sometimes the patient may become delirious and in rare cases fall into a comatose state.

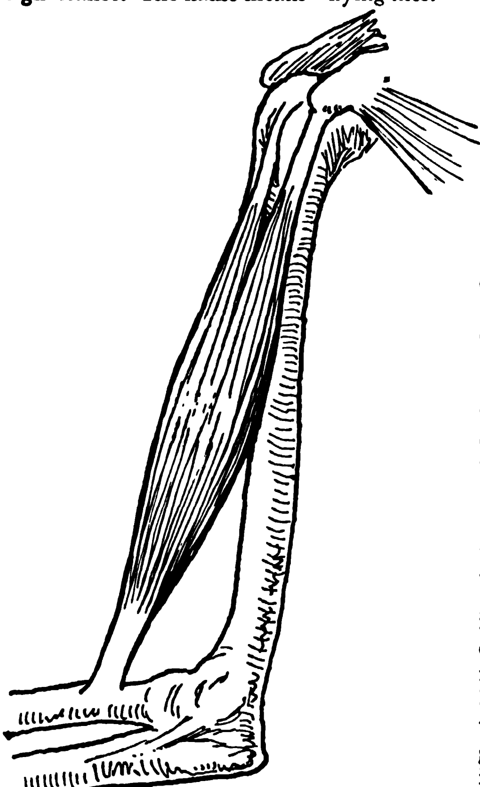
Treatment.—The patient must of course be put to bed and isolated with all the usual precautions against the spread of infectious disease. Fluid diet and sponging will keep the fever in check. The mouth must be rinsed at intervals with an antiseptic mouthwash such as potassium permanganate, and hot or sometimes cold fomentation should be applied over the swollen glands. It may be necessary for a doctor to prescribe something for the relief of the pain. After the patient recovers remember that the period of quarantine is three weeks. The germ of mumps does not live for very long so the drastic measures of disinfection are not necessary as they are for scarlet fever.

Complications.—Although simple mumps is not a dangerous disease, there are several complications which may be very dangerous. The worst of these complications is inflammation of the pancreas, called *pancreatitis*. This requires careful treatment, as in some cases diabetes has followed upon inflammation of the pancreas during an attack of mumps. In males the testicle sometimes becomes inflamed, a condition which is known as *orchitis*, and requires immediate treatment lest the gland should become weakened. Eye, ear and brain complications are fortunately rare with mumps, but they do occur sometimes, and incurable deafness is not very uncommon. Inflammation of the kidney (nephritis) may also arise after mumps.

MURMUR.—Any unusual sound, other than the ordinary heart sounds, which is heard when listening to the heart is called a murmur, or a bruit, which is a French word meaning a noise. Some murmurs are evidence of heart disease, but some have no especial significance. This was well shown during the war, when many men with "heart murmurs" performed as striking feats of endurance as their comrades with hearts

that made only the normal sounds. (*See also* HEART.)

MUSCÆ VOLITANTES.—These are the floating specks which sometimes appear before the eyes when the liver is upset. They are most often due, however, to the movements of the blood corpuscles in the tiny veins of the eye and have no particular significance. The name means "flying flies."



The Biceps Muscle of the Arm, showing the two heads from which it arises and the tendon in which it ends.

MUSCLE.—The muscles of the body are composed of cells which have the power of changing their shape, and it is by this power of the muscular tissue to change its shape that the movements of the body are able to be carried out.

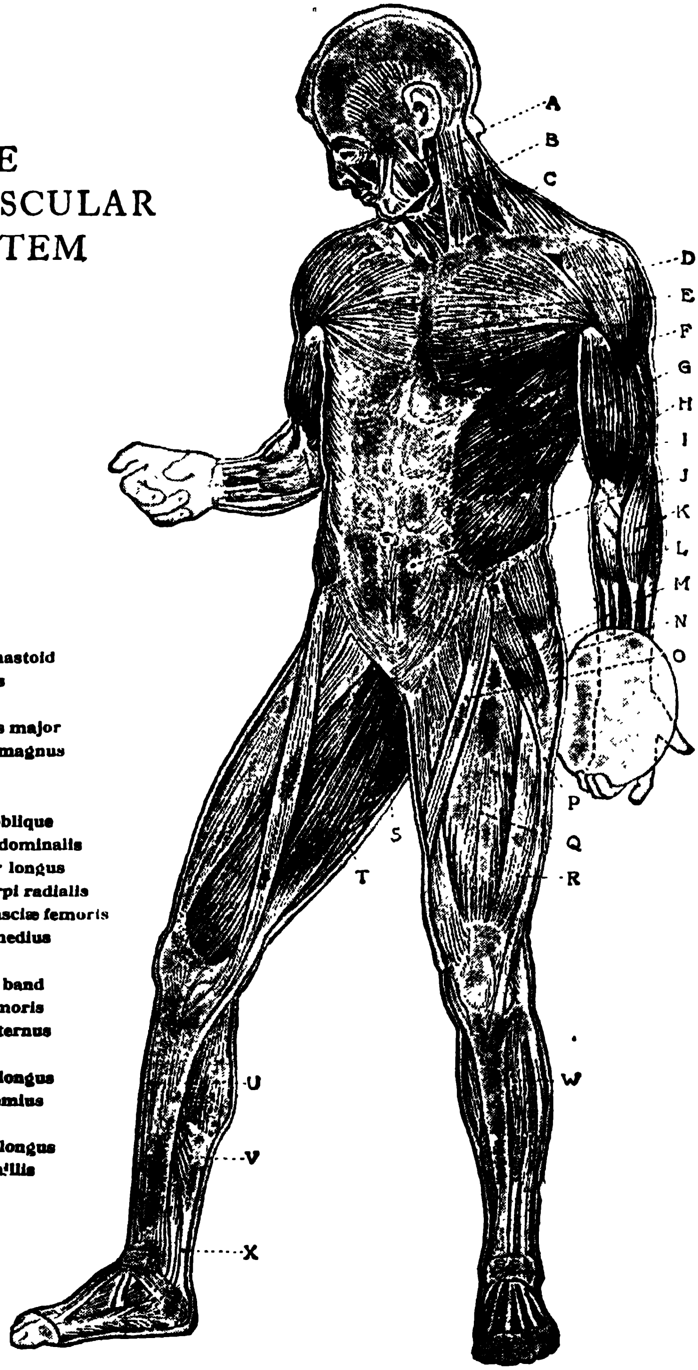
Muscles are divided into three classes: Striped muscle, which is also called skeletal or voluntary muscle; unstriped involuntary muscle, and the heart muscle. *Striped muscle* is so-called because when it is examined under a microscope its fibres show cross-striping. *Voluntary* muscle is one which can be controlled by the will of the individual, whereas involuntary muscle works without the conscious knowledge of the individual. The muscles of the arm are voluntary muscles, but the muscles of the stomach are involuntary. *Skeletal* muscle is the muscle tissue which covers our bones or skeleton. It is voluntary muscle, and it forms the greater part of the entire muscular tissue of the body. A skeletal muscle has an origin and an attachment. For instance, the origin of the biceps muscle of the arm is on the shoulder bone and its insertion is into the radius, one of the bones of the forearm. As well as a beginning and end there is the more bulky and fleshy main part of the muscle which is usually called the belly of the muscle. Muscles vary in shape: there are ribbon - shaped muscles, spindle - shaped muscles thicker in the middle than at the ends, and muscles like those in the abdominal walls which are in the form of thin sheets of muscular tissue.

Each muscle is composed of bundles of fibres separated by connective tissue and wrapped round in a sheath. Muscles are dependent on the nerves which are attached to them. These nerves provide the stimulus which puts the muscle in action. If, therefore, the nerve supplying any particular muscle is paralysed or severed, the muscle loses its power of movement.

In order to keep a muscle healthy and in good working trim it must be kept in constant use, or it will waste and become feeble. It is for this reason that the entire body needs exercising if the daily occupation is such that some sets of muscles do not get their share of use. Muscles can be increased in strength and bulk to a remarkable degree, as is shown by the enormously developed muscles of professional gymnasts, etc. The danger of over-developing the muscles is, however, that unless the exercise is kept up the muscles suffer from fatty degeneration, and the middle-aged athlete is, therefore, as often as not fatter and puffier than the individual who did not build up so much muscle when young.

Diseases and Injuries of the Muscles.—When a muscle has been overstretched it is said to be *strained.* A typical case of strain is when the ankle turns over suddenly and the muscle is sharply stretched. There is pain, and stiffness soon develops. A strained muscle should be rested and hot or cold

THE MUSCULAR SYSTEM



A—Masseter
B—Sterno-mastoid
C—Trapezius
D—Deltoid
E—Pectoralis major
F—Serratus magnus
G—Biceps
H—Triceps
I—External oblique
J—Rectus abdominalis
K—Supinator longus
L—Flexor carpi radialis
M—Tensor fasciæ femoris
N—Gluteus medius
O—Sartorius
P—Ilio-tibial band
Q—Rectus femoris
R—Vastus externus
S—Gracilis
T—Abductor longus
U—Gastrocnemius
V—Soleus
W—Peroneus longus
X—Tendo Achillis

applications can be put on to relieve the pain. Most authorities nowadays agree that the resting must not be overdone, but that massage and gentle movement should be begun at an early date. Muscles may be broken by violent stretching or possibly severed in an accident. Such a condition will of course require the attention of a doctor, and it may be necessary to cut down to the muscle to reunite the two ends. The ruptured muscle will, in any case, require to be kept at rest for a month at least.

Inflammation of the Muscles is called myositis and may occur in any situation in the body. It may be due to infection by germs, or to a chronic disease such as tuberculosis or syphilis. Fibrosis or thickening of a muscle may result from long-continued irritation, such as the condition known as rider's muscle. The muscles may be invaded by certain species of worms or by hydatids in countries where these parasites are found. Tumours sometimes arise in a muscle and are called *myomas*. Muscular rheumatism is called *myalgia* or *fibrositis*. Painful spasms in the muscles are called *cramps*. *Atrophy* or shrinking and wasting of the muscle may be the result of the cutting off of the nerve supply of the muscle, as in the case where the nerve has been severed, or it may be due to a rare and somewhat mysterious disease called progressive muscular atrophy, in which all the muscles of the body waste and the person finally dies. (*See also* CRAMP; FIBROSITIS.)

MUSCULO-SPIRAL NERVE.—The musculo-spiral nerve comes from the armpit, winds round the humerus, and controls the muscles extending to the elbow, wrist and fingers; it ends as the radial nerve. It is affected in the conditions known as *crutch paralysis* and *wrist drop*.

MUTISM.—This is simply another name for dumbness.

MYALGIA.—This is another name for muscular rheumatism. (*See also* FIBROSITIS; RHEUMATISM.)

MYASTHENIA.—Myasthenia or Myasthenia gravis, as it is more frequently called, is a rare disease of the muscles, the cause of which is unknown and for which no certain cure has yet been found. It usually comes on in young adults of either sex. There is a gradually increasing weakness of certain muscles. The first muscles to be affected are usually those of the head, eyes and mouth, then those of the chest, until breathing becomes difficult. The patient feels tired very easily and can only use the muscles after rest has restored them to a slight degree. There is great difficulty in keeping the eyes open or the mouth closed, and eating becomes almost impossible through great weakness. This state of weakness is gradually progressive. There is at present no known cure; but parathyroid gland has been tried in some cases and ephedrine in others.

MYCETOMA.—A tropical disease which is described under the heading MADURA FOOT.

MYCOSIS.—By mycosis we mean infection of the body by some form of fungus. Ringworm is a mycosis; thrush and actinomycosis are other diseases caused by fungi.

MYDRIATIC.—When the pupil of the eye is excessively enlarged it is called mydriasis. Drugs such as atropine, which are used to increase the size of the pupil, are called mydriatics. (*See also* ATROPINE; EYE; PUPIL.)

MYELITIS.—Inflammation of the spinal cord or softening of the cord is called myelitis. The condition is a serious and fatal one if it is due to disease, when paralysis and wasting occur, but if it is due to pressure on the spinal cord there is a possibility that the pressure may be removed and recovery effected. (*See also* PARAPLEGIA; POLIOMYELITIS; SPINAL CORD.)

MYELOMA.—A tumour in a bone which is found sometimes in young people. It is usually harmless but should be removed by operation.

MYOCARDIAL DEGENERATION.—Degeneration of the myocardium or heart muscle may be due to different causes, but the result is the same, namely heart weakness and heart failure. A common cause of myocardial degeneration is fibrosis, where the muscle is impeded in its working by an overgrowth of the fibres which surround it. Fatty degeneration is another common cause of myocardial failure. In obese people the fat is deposited in and around the heart muscle causing it to become weak and degenerated. Another form of degeneration known as waxy degeneration, also occurs usually as the result of a condition in which there has been a long septic illness (*See also* HEART.)

MYOCARDIUM.—The muscle of the heart is called the myocardium, and inflammation

of the heart muscle is called *myocarditis.* When the muscle is diseased the heart cannot beat strongly, so the result of myocardial trouble is to slow up the action of the heart's beating.

MYOLOGY.—Myology is the study of the muscles. It is a branch of the science of anatomy.

MYOMA.—Myomas are tumours which grow in or on a muscle, and are actually composed of muscle tissue. Other sorts of tumours, as for instance fatty tumours, also grow on muscles but they are not called myomas. They are only dangerous when they are so large as to interfere with the working of an organ. The commonest form is the fibroid tumour in the womb. (*See also* FIBROID.)

MYOPATHY.—Myopathy is a hereditary condition in which there is shrinking of the muscles without any apparent cause. It attacks young people in families which suffer from it, and males are more often the victims than females. Occasionally a case is seen in which there is no apparent family history of muscular weakness.

Symptoms.—The first symptom noticed is that the child's movements become clumsy and appear enlarged. By degrees the muscles are so affected that the child can only walk with a sort of waddling gait. When standing it keeps the legs wide apart, pushes the belly forward and draws the shoulders back. These children find it extremely difficult to rise from the sitting position, and go through peculiar contortions to raise themselves from the lying-down position.

Treatment.—No special treatment has been devised, but the general health must be kept as good as possible and the patient should be on a building-up régime. Massage and electrical treatment may do some good. Occasionally the disease is arrested.

MYOPIA.—Myopia is the technical name for short sight. (*See also* ASTIGMATISM; EYE; FIELD OF VISION; VISION, ERRORS OF.)

MYOSITIS.—Myositis is the medical name for inflammation of a muscle. Inflammations in the muscle itself are not very common, the trouble more often being in the tendon sheath. Inflammation of the muscle itself may arise as the result of such conditions as erysipelas or gas gangrene. The muscles may also be inflamed after such diseases as typhoid fever or a virulent influenza. (*See also* MUSCLE.)

MYOSITIS OSSIFICANS or RIDER'S BONE.—Sometimes repeated injuries or irritation to a muscle will cause it to harden almost as if it were a bone. This happens to people who ride a lot, and the muscle involved is the one in the crutch of the seat. It may also happen at the seat of a fracture. There is a rare form where all the muscles progressively harden for some unknown reason until the whole frame becomes rigid. Fortunately such conditions are very rare. Sometimes the word myositis is used loosely to mean a painful condition of a muscle and is used for such painful conditions as gout and muscular rheumatism. (*See also* FIBROSITIS.)

MYOTONUS.—The medical name for general fitness.

MYXŒDEMA.—This is a condition which is fairly common in middle-aged women though it occurs in men and children also. It is due to deficiency in the juice which is produced by the thyroid gland.

Symptoms.—The typical patient is a middle-aged woman who becomes fat and puffy, with coarse skin and bloated features. She has pudgy hands, muddy complexion with a slight flush over the cheekbones, and a loss of hair from the scalp, eyebrows, etc. The intellect usually becomes duller, the patient being heavier and slower in her speech and understanding than she used to be. Fat deposits occur in such regions as the shoulders, the abdominal wall and the breasts. A well-developed case of myxœdema is easy to distinguish, but the condition may creep on gradually without the woman noticing it until it is well established.

Treatment.—As the disease is due to thyroid insufficiency the results of administering thyroid extract appear almost miraculous. In a very short time the woman regains her health and will retain it as long as she takes the thyroid extract. A word of warning is due here. Thyroid extract has a marked effect on the heart and must never be taken except on a doctor's advice, and whilst the patient is on it she should be kept under observation from time to time, and should report at once any untoward symptoms such as palpitations or breathlessness, which means too much is being taken. (*See also* DUCTLESS GLANDS; THYROID GLAND.)

NÆVUS.—This is the name applied to mole, or birthmarks, especially those marks known as port-wine stains, strawberry marks, etc. (*See* also BIRTH-MARKS.)

NAILS, DISEASES OF.—*Abscess* of the nail is very often the result of a splinter, or some such material, being run in below the nail. Pus, or matter, collects, and there is always a great deal of throbbing pain owing to the pressure of the tight, firm nail upon the sensitive nail-bed. In order to allow the pus to discharge the nail may have to be cut or split, otherwise the pain may be almost unendurable, and there is always the possibility that the inflammation may spread and cause damage to the whole nail. As soon as there is any hint of inflammation occurring in the nail, hot fomentations or Antiphlogistine should be applied. (*See also* WHITLOW.)

Ingrowing nail is a condition which occurs frequently in the nail of the big toe and it can cause a great deal of misery and unhappiness. The main cause of this condition is trimming the nail in the wrong way, and in addition, when too tight shoes are worn, the nail is pressed into the flesh at the side causing inflammation. The nail should be cut straight across and not trimmed down in the corners, or they may be cut in a concave manner, thus:‿. (*See also* INGROWING TOE-NAIL; and CARE OF THE NAILS in the SUPPLEMENT ON BEAUTY CULTURE.)

Injuries to the nails cause them to turn black owing to the pressure of blood beneath them. If the injury has been severe, the nail is almost sure to come off; but a new one should grow in unless the injury has damaged the nail-bed very severely. A new nail takes, as a rule, about six months to grow in perfectly, and during this period the nail should be protected by wearing a finger-stall.

The appearance of the nails very often indicate the general state of health; for example, white spots usually make their appearance when the health is a bit below par and grooves indicate the presence of rheumatism. (*See also* CARE OF THE NAILS in the SPECIAL SUPPLEMENT ON BEAUTY CULTURE.)

NAPHTHOL.—A coal-tar product, naphthol is used as an antiseptic in cases of diarrhœa, typhoid fever, etc. It is used as an ointment on the skin in the treatment of eczema, scabies, and other skin disorders. It is of great use as an insecticide (a substance which kills insects), and as such it is used in moth-balls for preventing moths from destroying furs and clothes.

NAPKIN RASH.—This occurs in children with sensitive skins, or in those who have not been properly cared for. The treatment of this condition will be found under ERYTHEMA. (*See also* SUPPLEMENT ON BABY at the end of this book.)

NARCOSIS.—A state of unconsciousness which closely resembles deep sleep. The drugs which produce this condition are known as narcotics. (*See also* ANÆSTHETICS.)

NARCOTICS.—The most important narcotics or sleep-producing drugs are opium, hyoscine and veronal. Alcohol, chloroform and the other anæsthetics are also included. (*See also* DRUGS; ANÆSTHETICS.)

NASAL CATARRH.—*See* CATARRH, NASAL.

NASAL FEEDING.—*See* FORCIBLE FEEDING.

NASO-PHARYNX.—The naso-pharynx is the name given to the part of the throat which lies between the nasal passages and the back of the mouth.

NATIONAL HEALTH INSURANCE ACT, THE.—This Act, passed in 1911, has two main objects: (1) to secure for the insured person any necessary medical attendance; (2) to compensate him while sick, for the loss of his wages. The cost of this is shared between the worker, the employer, and the State. All wage-earners over 16 (unless their income exceeds £250) must be insured. 1/6 weekly is paid for men, and 1/1 for women, the employer paying 9d. and 6d. respectively. The contribution is paid by special stamps sold at any post office, and it is the duty of the employee to see that his card is kept stamped up to date. The State pays a definite proportion of the cost of the benefits, one-seventh in the case of men, and one-fifth in women.

The benefits of the Act are:

(1) Medical benefit, which includes free attendance, treatment and medicines. The insured person is entitled to this immediately on becoming insured.

(2) Sickness benefit, which consists of weekly payments to insured persons who are unable to work through illness. An insured

person is not entitled to any sickness benefit until 26 weekly contributions have been paid, when a man receives the "reduced benefit" rate of 9/- weekly and a woman 7/6. When 104 contributions have been paid, the person is entitled to "full benefit" rate of 15/- for a man, and 12/- for a woman. This is payable from the 4th day of the illness, and continues for 26 weeks.

(3) Disablement benefit. This may be given when the sickness benefit is exhausted, and consists of a weekly payment of 7/6. Only those who have paid 104 contributions are entitled to this.

(4) Maternity benefit. An insured woman, or the wife of an insured man, receives £2; and if husband and wife are insured, £4. An unmarried mother receives £2. Forty-two contributions must have been paid before a person qualifies for this benefit.

(5) Additional benefits. In exceptional cases the ordinary rates of cash benefits are increased. Where the Approved Societies (to which about 98 per cent. of insured persons belong), have available funds, an insured person may get payments towards dental, ophthalmic ("eye"), or convalescent treatment.

By an additional Act of 1928, an insured person is credited with contributions not only for every week during which he is employed, but also for those in which he is ill or genuinely unemployed. If, however, he falls into arrears, his benefits are reduced in proportion.

When a workman is entitled to compensation under the Workmen's Compensation Act, he can claim no benefit unless his compensation allowance is *less* than the usual benefit allowance, when the difference is made up.

A worker ceases to be insured at 65, when in most cases he becomes entitled to the contributory Old Age Pension. After ceasing employment, a contributor is entitled to benefits for about 1½ to 2 years; if he has been insured for 10 years, and becomes unemployed at 60, he is allowed benefits until 65.

The medical benefit arrangements are made by local Insurance Committees. Any registered medical practitioner may have his, or her, name on the "panel." An insured person may choose his own doctor, and can obtain medicines, etc., on the doctor's prescription from any chemist who does National Health Insurance dispensing. The doctor also gives various certificates, such as are required for sickness, disablement and other claims.

The most popular "extra" treatment is dental, which at present is provided for about 75 per cent. of all insured persons, and costs about £3,000,000 a year.

The National Health Insurance Act was at first very unpopular; doctors, chemists, employers, and even employees raising various objections. It has been, however, justified by its results, and any opposition has disappeared. It has proved to be a decided financial success, and distress from sickness and disablement has been tremendously reduced. In addition, it has been noticed that the death-rate has fallen materially since the introduction of the scheme.

NAUSEA.—A feeling of sickness, or the feeling that vomiting is about to take place, is known as nausea. This feeling may be caused by looking at an unpleasant sight or by smelling or tasting something unpleasant. There are many diseases in which the feeling of nausea forms one of the chief symptoms. Severe headache due to any nervous disturbance is usually accompanied by nausea. Many forms of indigestion cause this feeling to arise and relief may not be gained until actual sickness takes place. In cases where nausea is continually experienced, it is advisable to seek medical advice in order to have a thorough examination. Eye-strain is sometimes a cause of this condition, which will only be relieved by proper attention to the eyes and wearing suitable glasses if necessary. The nausea which is produced by sea-sickness is a well-known and definite type, also the feeling of nausea known as morning sickness which occurs during pregnancy. (*See also* PREGNANCY; SEA-SICKNESS; VOMITING.)

NAVEL.—The small wrinkled cavity in the middle of the abdomen is known as the navel or umbilicus. This marks the spot where the umbilical cord unites the child to the mother before birth. (*See also* CORD; UMBILICUS.)

NEAR-SIGHTEDNESS.—This condition is medically known as myopia. (*See also* SIGHT.)

NEBULIZER.—A throat and nose spray is sometimes called a nebulizer and it is

exactly the same as an atomizer. (*See also* Atomizer.)

NECK.—The neck is the column which supports the head, and it also contains the passages through which air and food are conveyed to the rest of the body. The skeleton of the neck is made up of seven cervical vertebræ to which are attached strong supporting muscles. A thick mass of muscle can be felt extending downwards from the back of the head, and at each side of the neck are very important muscles known as the sterno-mastoid muscles. These stand out very prominently, and it is the action of these muscles that turn the head from side to side. The painful condition known as stiff neck is due to a rheumatic inflammation of these muscles, and wry-neck is usually caused by strain on either one side or the other.

Many other important structures of the neck are closely related to the sterno-mastoid muscles, such as the carotid artery, the jugular vein, the larynx, the pharynx, the thyroid gland, and the vagus nerve—an important nerve of the heart. The larynx can be felt to move up and down in the front of the neck, especially during the act of swallowing. In men, the Adam's apple is a very prominent feature. In women, the neck is more plentifully supplied with fat and is, therefore, a more rounded structure than in the male. The neck is one of the regions where fat is liable to accumulate, and in stout people this takes the form of a "double chin."

Swelling of the neck is almost always due to enlarged glands which may be infected from the teeth, the tonsils or the ear. Tuberculosis is a disease which frequently attacks the glands of the neck; *see also* article on Glandular Fever. The swelling of the thyroid gland, which lies low down in the front of the neck, is fully dealt with under the heading Goitre.

Several large important veins run down the neck, the chief of these being the external jugular vein. Wounds in this part of the neck are liable to cause very severe bleeding and unless immediate measures are taken to arrest the hæmorrhage, death may result. A broken neck is almost always fatal owing to the inevitable damage done to the nerves connected with the brain. (*See also* Glands; Jugular Vein; Tuberculosis.)

NECROSIS.—Necrosis means the death of a part of the body, but the word is used with special reference to the death of bone. This state is usually caused by stoppage of the blood-supply. Septic inflammation occurs and may bring about a condition known as acute necrosis.

When the blood-supply is cut off from a part of a bone it becomes necrosed, and the vessels surrounding it form what is known as a layer of granulations around it. This granulation tissue gradually eats away the dead bone from the living bone so that it becomes loose, and the dead part is then known as a sequestrum. If this is very small it may be discharged with the pus which is given off from the granulations, and the cavity will rapidly heal once the irritation caused by the dead bone is removed. This happy state of affairs, however, does not always come about and the sequestrum, or dead bone, is more likely to be shut up in a cavity formed by healthy bone. An operation will have to be performed to remove the necrosed bone, otherwise a discharge of pus is liable to occur at any time. (*See also* Bone; Erosion; Gangrene.)

NEPHRITIS.—Nephritis, or Bright's disease, is a condition in which there is inflammation of the kidneys or there may be degenerative changes in the kidneys. There are several forms of this condition, but the chief varieties may be classified as acute and chronic.

Acute nephritis is frequently caused by exposure to cold or wet, or it may arise as a complication of some other disease such as scarlet fever, erysipelas or diphtheria. Inflammation of the kidneys may also occur as a result of poisoning by irritating substances such as turpentine or corrosive sublimate, etc. The disease mainly affects children and young adults.

Symptoms.—In some cases the onset of the disease may be insidious and the first symptoms to be noticed are redness of the urine and a certain amount of puffiness around the eyes. Other cases may develop quite suddenly, showing all the characteristic symptoms of acute nephritis within a day or two. Dropsy, or swelling of the body, with puffiness of the eyes, face and ankles, is almost always present in varying degrees. Vomiting and nausea frequently occur early on in the condition, and this leads to loss of

appetite and disturbance of the digestive system. The temperature is commonly raised to about 100° or 101° F., though in adults there may be no fever present. The skin is dry and the tongue furred, and the patient may be very troubled with headache. There is frequently pain in the back and loins, and diarrhœa may develop. Changes take place in the urine from the very beginning of the disease. It is greatly reduced in quantity and the colour becomes dark and smoky from the presence of blood. When tested, a large amount of albumin is found to be present and it also contains enormous numbers of blood-cells. The course of this disease is very serious, and if the state of inflammation is very severe it may lead to stoppage of the flow of urine altogether. Many cases show little improvement even after a few months, but even extreme cases may recover completely with the proper treatment.

Treatment.—As soon as a patient shows the slightest sign of nephritis he must be put to bed and kept as warm as possible. Blankets should be used instead of sheets, and flannel should be worn next to the skin. The temperature of the bedroom should be moderately warm and all draughts avoided. The doctor should be called in at once, as some cases quickly develop into the chronic stage, which, in many cases, proves fatal. If there is much swelling present, sweating may be induced by hot packs and hot-water bottles. The bowels must be kept open daily in order to help the elimination of waste matters from the body and so ease the work of the kidneys. There has recently been an almost complete change in the diet advised in acute nephritis. Instead of giving lots of fluids, and especially milk, to "wash out" the kidneys, it is now realized that so much fluid during the early stages only increases the œdema, and, in addition, milk contains salt and protein which are retained in the body while the function of this organ is impaired. In order to spare the kidney as much as possible, no salt and protein (milk) should be given and the intake of water should not be greater than the output of urine. For the first three or five days, therefore, only a little weak tea or lemonade or half an orange two or three times a day should be given. Then the diet may be increased by giving cooked fruit, sugar, cooked vegetables and rice, butter and cream. In about a week or ten days a certain amount of protein should be given—to keep up the needs of the body—in the form of milk, eggs, chicken, fish, with bread. There is no doubt that abstinence from food and drink in the early stages of acute nephritis is good treatment, but the thirst may be troublesome No salt should be added in cooking as long as there is any swelling present in the body. The patient must be kept in bed until all traces of blood have disappeared from the urine, the swelling has gone, and the temperature is normal. Large doses of alkalies, such as bicarbonate of soda and citrate of potash, are nowadays often advised with benefit. Iron tonics should be given during convalescence to deal with the anæmia which usually makes its appearance in connection with nephritis; these tonics will help to improve the appetite.

Chronic Nephritis may follow an attack of acute nephritis, but in some cases the acute attack may have passed unnoticed. Here again there are varying degrees of the condition, but the outlook is serious because of the degeneration which takes place in the kidneys. The swelling and dropsy tend to spread and may even affect the lungs.

Treatment.—Special care must be taken to avoid chills and the diet must be regulated by a doctor. The bowels should be kept open and no alcohol should be taken. It is now recognized that restriction of protein may be harmful in chronic nephritis, but the high protein diet now advised should not be given when the activity of the kidney is impaired. Such a diet consists of lean meats, whites of eggs, skimmed milk, gelatine, beans, peas, and oatmeal. (*See also* DROPSY; KIDNEY.)

NERVOUS BREAKDOWN is a result of a disturbance of balance between a person and his circumstances. Either the person is himself unable to adapt himself to his circumstances or the difficulties to be overcome are very great. Contrary to popular opinion, overwork is never a cause of nervous breakdown; worry, which will cause it, is a failure of the person concerned to cope with the situation. Normally nervous energy is built up through sleep and the forerunner of many a nervous breakdown is sleeplessness acting on a person whose bodily health has been allowed to suffer.

Treatment.—The treatment of such a nervous breakdown varies, but nearly always begins with rest in bed and as much sleep as the patient can be made to obtain.

NERVOUS HEADACHE may mean one of two things: either true migraine, or a means of escape from some disagreeable circumstance which the victim does not, unconsciously, want to face. The prospect of a long railway journey, or a visit to a disliked relative, will in many people produce the most violent headache. This headache is nearly always said to be a "pressure," rather than an ache, and is mostly situated on the top of the head. The scalp is tender, and any slight noise, or even a whisper, will irritate the victim beyond measure. Drugs may, or may not, give relief; but as the underlying cause of the headache is in the mind, only by getting to the real cause of the trouble and treating it by psychotherapy is there a hope of permanent cure of a nervous headache. (*See also* MIGRAINE.)

NERVOUS SYSTEM is the means by which each part of our body is made aware of what is the condition at any particular moment of every other part, and also is the means by which we communicate with the outside world. Even such lowly creatures as earthworms have some kind of a nervous system in order that one segment of the worm may know where the other segments are. This is not to say that an earthworm is capable of feeling pain, a function of the nervous system which is only developed in animals much higher up the scale in the animal kingdom.

In man, the nervous system is generally divided into the central nervous system, which consists of the brain and the spinal cord, and the peripheral nervous system, which consists of all the nerves in the body other than those attached to the brain itself. The brain is described under a separate heading, and under this heading also will be found an account of the peculiar structure of nervous tissue. Here it will only be mentioned that the nervous system consists essentially of nerve-cells and a supporting tissue. A nerve-cell has a body and processes. The processes which conduct impulses away from the cell (like an electric charge along an electric wire), are called *axons;* whilst those which take the impulses to the cell are called *dendrites*. There are countless numbers of these nerve-cells and their processes in the nervous system, but their function is the same, that of conducting impulses. Each cell with its processes is one unit, and many units are bound up together according to the various kinds of impulses they conduct, rather like a number of coaches being joined up to form one long train going to a certain place. Some of these bundles of units control the movements of the body; others are responsible for telling us where our limbs are in space, or whether we are touching something hot or cold. Some bundles of units run from the brain, down through the spinal cord and out into the nerves, right into the skin. Others do not run throughout the nervous system in that way, but run only in the nerves and into the spinal cord.

The *spinal cord* is a nervous tissue which runs from the bottom of the skull, inside the backbone, down to the level of the top of the haunch bones. It contains all those conducting paths whereby we move, feel heat and cold, and know where our limbs are when our eyes are shut. If the spinal cord is cut across by a broken backbone, for example, the body below the injury is completely paralysed; and if the injury occurs above a certain level, death is bound to follow almost immediately because the chest muscles become paralysed; so that the lungs can no longer expand and breathing stops.

From the spinal cord, nerves are given off in pairs all the way down the spinal cord to travel outwards through a space in the bony backbone to supply all the muscles of the limbs, internal organs and skin of the body. These nerves are like long pearl-grey cords when they first leave the spinal cord, but they split up into smaller and smaller branches as they pass on their way, until it is almost impossible to see their small branches to the skin with the naked eye. These nerves carry different bundles of nerve units also. There are the units which run to the muscles and cause them to contract; these are called *motor* units. Then there are the units by which we feel touch or pain or temperature; these are called the *sensory* units. If a nerve is damaged, usually both these systems of units are injured, but certain diseases seem to pick out certain units. For example, in lead poisoning the "motor" units are mainly affected, and weakness of the limbs is especially noticed. In neuritis caused by alcohol poisoning the

"sensory" units are chiefly picked upon and pain is the outstanding feature of this condition.

The internal organs, such as the heart, digestive organs and lungs, not only have the ordinary nerve supply which controls their action, but they have a special nerve supply called the *sympathetic* nervous system, which is the policeman of the nervous system as it were. When there is a need for sudden action on the part of the whole body, as, for example, to run for one's life from a wild beast, the sympathetic system takes charge and enables all the energy of the body to be concentrated on the act of running. The muscles get an extra blood supply because the sympathetic system tells the blood-vessels to the muscles to enlarge; the heart pumps more forcibly to send the utmost amount of blood as quickly as possible through the body; all digestion stops so that as little blood as possible is taken up by the digestive organs, and lungs expand and contract more strongly than normal to get as much oxygen into the blood in as short a time as possible. The sympathetic nervous system is situated in the spinal cord and the lowest part of the brain, from which tiny nerves are given off to all the organs of the body. We are never conscious of the sympathetic system and we have no control over it, because it is an "emergency system" which is always ready to act and is therefore not to be used at will. Nevertheless, in some people the sympathetic system is more irritable than in others, and in them, a very slight fright will produce all the symptoms which we associate with a state of terror. (*See also* BRAIN; NEURITIS.)

NERVOUSNESS is also one of the features of the condition of anxiety and must then be looked upon as part of that affliction. Nervousness which finds expression in a definite fear of some object or situation (for example, fear of dogs, fear of catching a particular disease, fear of travelling in underground railways, etc.) is practically always a symptom of a *neurosis* and must be dealt with by the treatment suitable for that mental trouble.

In children, nervousness is very common, especially in only children upon whom too much attention is lavished. The beginning of this nervousness in children may be in very early childhood and may be caused by a fright or by terrifying the child with stories of "ghosts" or "bogies" to induce it to sleep alone in the dark. Much harm is caused by such stories. Nervousness in children shows itself in a number of different ways. Such children are usually pale, thin and small for their age. They are nearly always very intelligent and do well at school; but they sleep badly and may have "night terrors," screaming in their sleep and waking bad-tempered and unrefreshed. Their digestions are often very poor and they may have frequent "bilious attacks" and be so sick that serious illness may be suspected. They may also have attacks of fever with quite high temperatures, so that infectious illnesses are thought of. Other ways in which nervousness in children may be shown is in certain habits: thumb-sucking, nail-biting, queer movements of the face, hands or shoulders are all common in these children. It is said that all these things right themselves when the children get to the age of puberty, but much mischief may be done to the child's character if the cause of the nervousness is not discovered. The great point about these children is that they are so intelligent that it is worth while to find out why their lives are not as normal as they should be, and to help them to adjust themselves to their surroundings. The family doctor is the right person to try to gain the child's confidence to find out the cause of the nervousness. Often the child is too frightened of its parents to confide in them. Lately, certain centres called Child Guidance Clinics have been started in many large cities to help these children, and many doctors are sending their small patients who suffer from nervousness to these clinics. A child who suffers from nervousness, if untreated, becomes an adult who suffers from a neurosis, and nervous disease in adults is much more difficult to cure than it is in children in whom fewer paths of memory have been established. (*See also* ANXIETY; NEUROSIS; and SUPPLEMENT ON CHILD-WELFARE, p. 765.)

NETTLE-RASH.—An eruption of the skin, similar to the effect produced by the sting of a nettle, is known as nettle-rash, or urticaria. (*See also* URTICARIA.)

NEURALGIA is pain felt along a nerve. There are very many different causes for neuralgia as well as many different positions where the pain may be felt, but the character

of the pain is nearly always the same. The pain of neuralgia is of a severe shooting or throbbing nature and the skin, along which tiny branches of the nerves run, is often very tender to the touch. Another curious feature of the pain of neuralgia is that it is not continuous but occurs in little bouts, which are made worse by exposing the skin to the cold. Neuralgia may be the result of changes in the nerves, when the pain is said to be due to neuritis; or the nerves themselves may be perfectly healthy, the pain being caused by pressure on the nerves by other structures; or the nerves may be irritated by some disease of structures with which they are in contact. In some few cases it is not possible to find out why neuralgia occurs, and this, unfortunately, is the fact in one of the most painful forms of neuralgia—the kind known as *tic douleureux.*

This is felt on the face, usually on one side only, all over the one side, or round the eye only, or rarely, round the nose and chin only. The pain is exceedingly sharp and is always felt worst in a draught or in cold weather. The skin of the part of the face on which the pain is felt is so tender that patients dread washing their faces, and if asked to show where the pain is situated they do not touch the face, but carefully keep their pointing finger a half an inch away from the painful area when indicating its extent. The lightest touch in severe cases will bring on an attack of this tic douleureux, and the pain may become so bad that these unhappy patients will even think of suicide rather than endure it. Fortunately, we can relieve this pain by means of an injection of alcohol into a nerve of the face; according to which part of the face is most painful, so the alcohol is injected into one or other branches of the nerve. The result is that the patient loses the pain, but is left with a numb feeling on that side of the face. It may be necessary to repeat this injection in a year or eighteen months, but the relief afforded by the injection can really only be appreciated by those who have suffered from this pain of tic douleureux.

In a few cases it would seem that some kind of irritation causes the pain, not in the nerve itself, but in a collection of nerve cells called a ganglion, connected with this nerve inside the skull. In these cases, injecting the nerve has no effect; but, luckily, it is possible to inject alcohol into this ganglion and usually, when this operation—which in skilled hands is a very slight one—is carried out, the relief is permanent.

But not every pain on the face is due to tic douleureux. Much more often is neuralgia of the face caused by decaying teeth, the nerves of which are connected with those of the face. And even a plug of wax in the ear has been known to give rise to very bad neuralgia of the temple. Neuralgia of the back of the head is very common after sitting in a draught, and this is due to a slight thickening of the covering of the muscles of the back of the neck which presses on the sensitive nerves.

One form of neuralgia may puzzle many doctors before the spots of "shingles" appear. Perhaps four or five days before a crop of "shingles" shows itself, a patient may complain of neuralgia on one side of the chest, abdomen or face. Nothing can be found to account for this pain until the spots appear.

Other causes of neuralgia may be such general diseases as diabetes or arteriosclerosis, whilst the early pains of locomotor ataxia are often taken for a simple neuralgia. *Sciatica*, which is one of the forms of neuritis and is described under that heading, always starts as a neuralgia.

Treatment.—The cure of any type of neuralgia depends entirely on the cause, but the pain itself is dealt with in three main ways. These are by means of heat, warmth, and the use of drugs which make the whole nervous system less sensitive to pain. Heat and warmth are best applied by hot fomentations, plasters, or antiphlogistine. The drugs which "damp down" the sensitiveness of the nervous system to pain are many, and the choice of a suitable drug for this purpose depends on the individual, since some people have queer reactions to certain drugs and are unable, therefore, to take them. The coal tar group of drugs such as aspirin, phenacetin and pyramidon are often helpful, whilst in other instances the bromides or tincture of gelsemium afford relief. Rarely, if ever, is the use of morphia required or justified in neuralgia, since the habit of taking morphia is soon learnt, and many a morphia fiend first learnt the effects of the drug through being given it to deaden the pain of a severe neuralgic attack. (*See also* ARTERIOSCLEROSIS; LOCOMOTOR ATAXIA; NEURITIS.)

Neuralgia of the Skin (Dermatalgia).—Dermatalgia is a word derived from two Greek words, and means "painful skin." It is also called "neuralgia of the skin." It is caused by various diseases, such as cold, rheumatism, and gout; chlorosis and anæmia; hysteria; neuritis; malaria; syphilis; diabetes; locomotor ataxia, and other diseases of the central nervous system. Sometimes it has to be distinguished from the pain occurring in shingles before that "rash" comes out; this is a true neuralgia, and the pain lies deeper than that of dermatalgia. The most severe form is that in which the hairy parts of the skin are affected, when every movement of the hair causes acute pain.

The treatment is that of the main cause, whatever it may be; and in any case dermatalgia usually disappears of itself in a few weeks. In the meantime, it may be relieved by the application of heat to the affected parts, which may be combined with the use of tincture of iodine. This should be painted on at night, omitting the treatment every third night, or irritation and peeling of the skin will occur. Heat and iodine may also be applied to the spine, over the spot whence the nerve supplying the affected skin arises. Salicylic acid and similar drugs, or quinine, are also given. For dermatalgia of the hairy parts, ichthyol taken internally is considered to give most relief.

NEURASTHENIA is a state of chronic mental and physical weariness for which there is no obvious cause. People who suffer from this very common complaint feel bodily and mentally tired as soon as they attempt to undertake the ordinary tasks of life. It is difficult, or sometimes becomes impossible, for them to carry out their daily work owing to a loss of confidence in themselves and to the trouble they have in concentrating upon the job in hand. More often, perhaps, they manage to get through their work, but this is below the standard which has previously been achieved. It is most typical of patients who suffer from neurasthenia that they are at their worst in the morning. Although they may, and usually do, sleep fairly well, they awake tired and unrefreshed, getting less tired as the day goes on, unless they have to work hard, in which case the amount of tiredness produced is out of all proportion to the amount of work performed. It is an interesting fact about neurasthenia that patients suffering from it are anxious to do their work well and often worry unnecessarily over it, bewailing the fatigue that comes upon them when they attempt to concentrate on it.

This tiredness, which is so characteristic of neurasthenia, may be accompanied by many other symptoms which suggest bodily illness. Thus, mental effort may produce a violent headache, or more commonly a feeling of pressure on top of the head. Reading makes the eyes ache or produces the sensation of spots in front of the eyes. Walking makes the patient with neurasthenia desperately weary; food makes him feel sick or gives him indigestion, whilst any special excitement gives him violent palpitation or pain over the heart. All these complaints may be made in the course of a single interview by a patient with neurasthenia, and such a case may need the most careful examination to exclude any true bodily illness. Sleeplessness is not common in neurasthenia; when it occurs, it will often be found that the patient has no difficulty in getting to sleep, but he wakes early and then lies and thinks about his unhappy state of health. All these patients are very anxious to get well and will accept any suggestions regarding treatment which are made to them, but only for a short while; the prolonged treatment which is necessary to cure them becomes very tiresome, and so they drop it and go from doctor to doctor, always hoping that someone will be able to "wave a magic wand" over them and cure them in a night.

Treatment.—The treatment of neurasthenia is both mental and physical. At first rest in bed free from all worry is essential. Daily routine exercises which are graded according to the doctor's estimate of what the patient can comfortably do are an important part of the treatment. These exercises are daily increased so that the whole physical system is built up. Usually there is much constipation and this should be thoroughly treated. Any sources of sepsis, such as bad teeth, must be attended to. On the mental side much encouragement and help must be given. Very often painful and half-forgotten memories, especially those connected with the sex life, play an important part in the production of neurasthenia, particularly if feelings of guilt are linked up with these memories. A frank discussion

with the doctor of such difficulties and problems will do much to assist the mental recovery. Later, when the patient is fit to undertake light work, tonics are called for, as many cases of neurasthenia have an unusually low blood-pressure, which may in some measure account for their excessive tiredness. Recently, these cases have been shown to benefit from the administration of an extract of the supra-renal gland, a small gland which is situated above each kidney and which has, as one of its effects, an influence on the blood pressure.

Traumatic Neurasthenia is a state of fear combined with pain which follows on some direct injury or shock. It is very common after train accidents in which the patient has not himself actually been hurt, but has seen others hurt. It very seldom follows serious injury. After a slight injury in an accident the pain persists long after the injury has healed and the patient suffers from general nervousness and, as in ordinary neurasthenia, is unable to concentrate on his work. Traumatic neurasthenia has been the subject of much discussion in the law-courts because of compensation for the condition, and no exact conclusions have as yet been come to, either in law or from the medical aspect. Where it has been shown that a man was previously perfectly fit and, as a result of the accident he witnessed or was involved in, has been completely incapacitated from working at all, compensation has usually been given; but in any particular case it is impossible to prophesy what view will be taken in court. (*See also* NERVOUSNESS.)

NEURITIS means inflammation of a nerve, and the changes in the nerve are those of swelling and redness which are associated with that process. Consequently the work of the nerve cannot be carried on normally, but as has been explained previously (*see* NERVOUS SYSTEM), nerves are made up of several bundles of nerve units, these bundles serving either to control the movements of the muscles of the limbs, or to convey to our minds the sensations of heat, pain or touch. According as to which particular bundles are damaged in a neuritis, so will the main symptoms be either those of loss of power in the limbs, or of pain, but usually some bundles of both systems of units are damaged, and so although the chief symptoms may be those of loss of power, yet the patient will also have some pain in the part of the limb controlled by the particular nerve, and he will be unable to feel things as well as usual in the limb: it will be numbed.

The causes of neuritis are many; but, generally speaking, the chief causes are poisons, whether simple chemical poisons, or the poisons produced by disease in the body, or by such germs as that which gives people diphtheria. The chief chemical poisons which may give rise to neuritis are lead, arsenic and alcohol. *Lead poisoning* is rarer now than it was, as lead paint is not used so much. Lead neuritis particularly picks out the nerve units going to control the muscles of the arms and hands, and loss of power in the hands with dropped wrists is typical of this kind of neuritis. *Arsenic neuritis* is seen sometimes as the result of taking arsenic over a long period of time, but one outbreak of arsenic poisoning with neuritis took place in 1906 as the result of accidental contamination of beer with arsenic. This form of neuritis chiefly affects the legs and loss of power with intense pain occurs.

Alcoholic neuritis is the result of drinking spirits in large quantities over a long period of time. It is one of the most painful forms of neuritis known, and attacks both the arms and the legs.

In diphtheria, neuritis of a particular type occurs: the nerves which control the movements of the eyes and of the palate are damaged by the poison made by the germ of diphtheria and so the patient is unable to read, as he cannot fix his eyes on the print; and food, instead of going down the gullet, is brought back through the nose. The outlook for this form of neuritis is good, as it nearly always gets better within a few weeks.

Certain general diseases may give rise to neuritis. Of these, diabetes is the most common and important, because it most often gives rise to neuritis in one, or both, sciatic nerves, the large nerves which run down the back of the thighs and legs, and so causes sciatica. Many cases of sciatica are found to be due to diabetes, and not until this general condition is treated will the complaint be cured. Sciatica is a very painful form of neuritis, and occasionally needs such energetic treatment as exposing the nerve through a surgical operation and injecting it with a solution to deaden the pain. But fortunately, most cases of sciatica yield to

the more simple measures of rest, heat, warmth and stretching the nerve.

Treatment.—The first thing is to discover the cause and to remove it at once. In the first stage of treatment, after the cause had been removed, the patient must rest in bed. When the pains are severe, application of heat and liniments containing belladonna often give relief. Massage, at first very gentle and then more energetic, is very helpful. (*See also* NERVOUS SYSTEM.)

NEUROLOGY.—This name is applied to the branch of medicine which deals with the nervous system and its diseases.

NEUROMA.—Neuroma means a tumour connected with a nerve. They are usually composed of nerve tissue and may be exceedingly painful. (*See also* TUMOUR.)

NEURON.—A neuron is one of the countless number of units of which the nervous system is composed. Each neuron consists of a cell and its various processes. (*See also* NERVOUS SYSTEM.)

NEUROSIS is a mild form of mental disorder in which the troubled mind draws attention to itself by causing some bodily symptoms. There are many different kinds of neurosis, and the more important ones are discussed under the headings of ANXIETY, HYSTERIA and NEURASTHENIA. Broadly speaking, a neurosis is the result of a battle between the conscious mind, which has been trained to adapt itself to our present social code, and the unconscious mind, which is for ever striving to obtain for the individual that pleasant, selfish and wholly irresponsible life which he enjoyed as a baby. (*See* MIND.) Normally, people manage to balance their lives so as to satisfy their primitive instincts without much conflict between the conscious and unconscious minds, but when the conflict is at all severe a neurosis develops to hide the real cause of the conflict.

One particular kind of neurosis is known as *occupation neurosis*. It is not yet certain exactly how this type of neurosis is related to the common types. An occupation neurosis may occur in any occupation in which there is a constant repetition of similar movements. The most familiar example is *writers' cramp*. Telegraphists and violinists are also very liable to suffer from the same complaint. The hand cannot perform the required movements: cramp in the small muscles of the hand produces stiff fingers which cannot hold a pen or draw a bow across a violin. Often there is discomfort or actual pain in the affected hand. Any other movements, except those connected with the occupation, are, nevertheless, well performed. The outlook for people with an occupation neurosis is not very good, since, although one attack may be cured by rest from the particular occupation combined with *psychotherapy*, yet the condition often returns when the occupation is resumed. In writers' cramp, very often devices can be made to overcome the spasm of the muscles: other fingers may be used to hold the pen, or a larger or smaller penholder may be used. The detailed treatment of the neuroses will be found under separate headings, but in general the treatment of all types of neurosis consists in psychotherapy together with treatment of such bodily conditions as overtiredness and sleeplessness. (*See also* PSYCHOTHERAPY.)

NEUROTIC.—Anyone of a very temperamental nature whose actions are influenced by the emotions is said to be neurotic.

NEW SKIN.—A proprietary preparation known as New Skin is used as an anti-septic covering to slight cuts or wounds. It is much the same and acts in the same way as collodion. (*See also* COLLODION.)

NICITATION.—An abnormal habit of winking. This may occur in hysteria or other nervous diseases. (*See also* TIC.)

NIDUS.—A central point or place in which a germ finds conditions suitable for growth and development. The word literally means a nest.

NIGHT-BLINDNESS.—In this condition the eye does not possess the normal power of rapid adaptation to a dim light. A patient so affected gets along quite well in daylight, but when the sun goes down he is practically blind. If he leaves a brightly-lighted room for a dark one, he gropes along helplessly. Many night-blind people cannot see the stars, their light being insufficient to affect the eye.

Night-blindness occurs in four different types of case: (1) As an inherited condition, which is incurable. (2) In some diseases of the liver, where bile salts circulate in the blood and affect the retina. (3) As a symptom of insufficient nourishment. In these cases it may be epidemic (as in India), and good feeding will cure the condition. (4) In disease of the retina or choroid, especially retinitis pigmentosa. In most of these cases

treatment is useless. In (3) and (4) colour vision is also frequently affected to some extent. (*See also* COLOUR BLINDNESS.)

NIGHTMARE is a terrifying dream in which the sleeper undergoes the most horrible experiences, such as being chased by wild beasts, or being imprisoned in a burning house, or falling from a great height; or he may be inflicting pain on others or see others suffer without being able to help them. The victim of a nightmare awakes either with a cry, or in a cold sweat, and always with a feeling of suffocation. Formerly it was supposed that a nightmare was due to indigestion following a heavy meal late at night, but recently it has been shown by Freud that a nightmare must be explained in the same way as any other dream (*see* DREAMS): that is, as a disguised expression of a childish wish. (*See also* FREUDISM.)

NIGHT TERRORS.—These occur in highly-strung nervous children who are permitted too much excitement and indigestible articles of food last thing at night. Whilst not serious, the attacks are alarming, the child waking up after an hour or two in bed, screaming and in a state of terror. The child is soon soothed however by a few comforting and reassuring words. A routine of regular meals, exercise in the open air, and an avoidance of excitement or fatigue should be practised and strictly adhered to.

NIPPLE, DISEASE OF (Paget's Disease).—This is a serious disease of the nipple which begins with a peculiar hardness of the skin and goes on to intractable ulceration. It is a form of cancer which commences in the milk-ducts or tubes at their endings on the surface of the nipple. It spreads to the nipple itself, to the areola or brownish area surrounding the nipple, to the skin of the breast, and finally, after some months—perhaps as long as two years—downwards into the substance of the breast.

The surface of the ulcer is raw, dark red, granular or roughened, and moist. Sometimes crusts or scabs hide the condition to some extent. Slight itching is generally present, and this alternates with attacks of pain, which is sometimes very severe.

The disease nearly always attacks women of middle age. It often happens that the patient "knows there is something wrong," but lets the condition run on from day to day, and month after month, until at last, frightened by the increasing pain, she seeks medical advice. Pain in the breast should always have the opinion of a doctor, even if it does turn out to be only a neuralgia.

Treatment.—This consists in the removal of the whole breast. This may sound rather drastic as a cure for what appears to be merely a patch of raw skin, which in its earlier stages might be covered by a penny; but attempts at removing a part of the breast are found to give very unsatisfactory results, and the complete operation has to be performed later in any case, if the patient's life is to be preserved. (*See also* CANCER; DERMATITIS; PAGET'S DISEASE.)

NITRATE.—A salt formed by nitric acid. In medicine the nitrates in common use are nitrate of potassium and nitrate of silver.

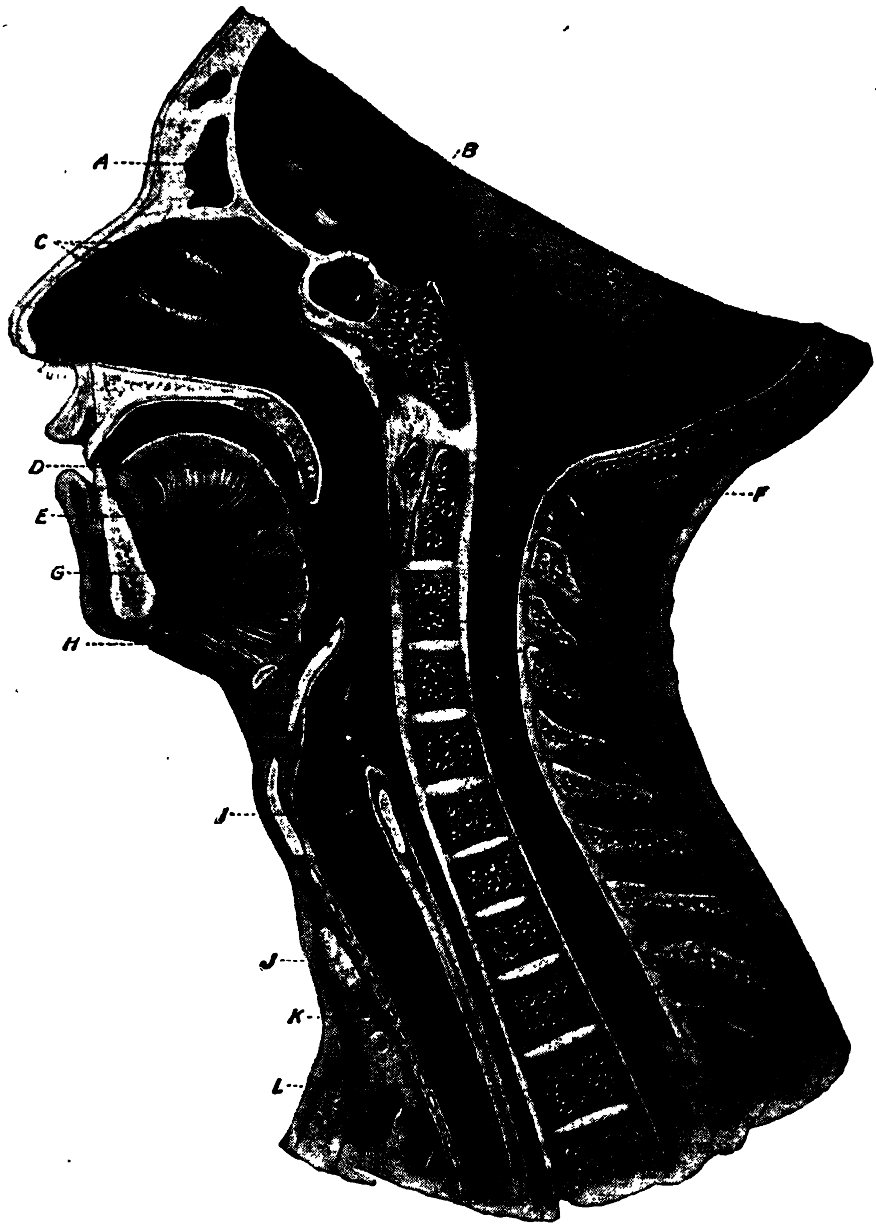
NITRIC ACID.—Nitric acid is greatly used to destroy warts because of its powerful caustic action on the tissues. It is usually applied drop by drop by means of a glass rod, and if its action is too caustic, a remedy can be applied by means of a few drops of a common salt solution applied in the same way. A solution of nitric acid is used as an antiseptic for destroying foul ulcers or sores, leaving clean ulcers in their place, thus preventing the danger of spreading. Like all acids it is an antiseptic, but it is too irritating to be used for ordinary purposes even in weak solutions.

NITRITE.—Nitrites are salts which have a powerful effect on the blood-vessels and they are used to check spasms of all sorts. The most commonly used nitrites are nitrite of amyl, of potassium and of sodium. (*See also* AMYL NITRITE.)

NITROGEN.—About two-thirds of the atmosphere is made up of nitrogen, a colourless, odourless gas necessary to all animal and plant life. (*See also* AIR; OXYGEN.)

NITROGLYCERINE.—This oil, which is well known in other circumstances as an explosive, has the same action as amyl nitrite and it is frequently taken by people who suffer from severe pain in the heart. Occasionally it is given to relieve asthma. It has also been used in the treatment of sea-sickness and conditions in which there is excessive blood-pressure. (*See also* AMYL NITRITE; ASTHMA.)

NITROUS OXIDE.—This is also known as laughing gas and it is given as an anæsthetic for short operations. (*See also* ANÆSTHETICS.)



THE NOSE AND THROAT

A—Frontal Sinus
B—Sphenoidal Sinus
C—Superior, middle and interior turbinals
D—Soft Palate
E—Tonsil

F—Spinal Cord (leading from the Brain and containing the Spinal Cord. The brain and spinal cord have been removed in this illustration)

G—Tongue
H—Epiglottis
I—Vocal Cord
J—Thyroid Gland
K—Trachea or Windpipe
L—Œsophagus or Gullet

NOCTURNAL EMISSIONS.—Emissions of the seminal fluid which occur during the night should be looked upon as natural and quite harmless unless they occur too fre-



Coronal section through Nose, showing nasal passages and maxillary antra

quently and are followed by depression next morning. The length of time between each emission varies with each individual; but, as a rule, an interval of ten days or a fortnight may be looked upon as normal. Plenty of exercise, a cold tub in the morning and good plain food are helpful in reducing their frequency. (*See also* SEX HYGIENE.)

NODE.—A node is a lump or swelling usually upon the surface of a bone. The term nodule is applied to small swellings.

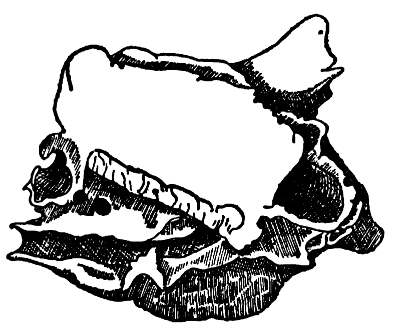
NORMAL.—Generally speaking, the term normal is used in connection with anything that conforms to regular and established order. *Normal saline solution* is common salt dissolved in distilled water, so-called because the amount is similar to that in the body-fluids.

NOSE.—The organ which supplies us with a sense of smell is situated in the nose, but the nose has a much more important function, in that it forms the upper end of the air passages which lead to the lungs and so provides us with a means of breathing. The nose may be divided into two parts, the projecting or external part, and the internal or nasal cavities. The external part of the nose is formed by bone and cartilage and at the lower part are two openings, the nostrils, which form passages into the internal cavities. When the nose is injured, some of the cartilage is liable to become dislocated, thus altering the shape of the nose and the whole expression of the face.

The interior of the nose is divided into two narrow cavities by a thin partition known as the septum, and these cavities run directly backwards about two inches. The septum is covered with the general mucous membrane which lines the nose. On each side three delicate bones, the turbinals, project into the nasal passage; they come from the ethmoid bone, which has air cells in it connected with the nose, similar to the frontal sinus and the maxillary sinus or antrum. The inner parts of the nose are lined with mucous membrane beneath which lies what is known as erectile tissue, that is, tissue which is capable of being engorged with blood. When cold air is drawn into the nose, this engorgement takes place, so that the air is warmed before it descends into the more delicate air-tubes. Besides being warmed the air is also moistened, and the little hairs which project from the cavities tend to serve as filters for any particles of dust. For diseases of the nose *see also* ADENOIDS; ANTRUM; CATARRH, NASAL; FOREIGN BODIES; POLYPI; SINUS.

NOSTALGIA.—Nostalgia is a feeling of homesickness which may become so pronounced as to cause great mental depression. In some people this feeling may become a very serious condition; it is particularly marked in those who are used to hills and who are forced to live in low-lying country. Sailors frequently long for the sea after they have given up their sea-faring life.

NOTIFICATION OF DISEASE.—The diseases a medical practitioner is compelled by law to notify are the following: Smallpox, scarlet fever, typhus fever, typhoid fever, relapsing fever, continued fever, puerperal



Ethmoid Bone

fever, puerperal pyrexia, diphtheria, erysipelas and tuberculosis. Certain other diseases may be made notifiable at the option of the local sanitary authority.

NOVOCAINE.—Novocaine was introduced as a substitute for cocaine and it is greatly used as a local anæsthetic. When injected it is just as efficient as cocaine and it has the advantage of being very much less poisonous. (*See also* ANÆSTHETICS; COCAINE.)

NUCLEIN.—Nuclein is a substance resembling protein and it is an important part of all living cells. It can be obtained from yeast and from various tissues containing large numbers of cells. Nuclein and nucleic acid are said to stimulate the growth of white blood-cells, and therefore to act as an agent which destroys germs. They have been used in the treatment of septicæmia, anæmia, scarlet fever, puerperal fever and tuberculosis.

NUCLEUS.—The central part of a cell which controls its activities is known as the nucleus. (*See also* CELL.)

NUISANCE.—In medical terms that which is offensive or troublesome, applied to people or things, is looked upon as a nuisance. A foul cesspool, or a collection of putrid rubbish, if proved to be a nuisance, should be reported to the local medical officer of health.

NUMBNESS.—Apart from being a symptom of a disease, numbness or loss of sensation may occur in a limb by pressure on a nerve. Such a condition is sometimes noted in the hand when pressure has been put on the elbows. In many diseases of the nervous system, numbness may occur in various parts of the body, especially in the hands and feet; this is frequently found in those who suffer from hysteria. Limbs may go numb if they are left too long in one position and patients who are bed-ridden should be moved from time to time in order to allow the blood to circulate freely. (*See also* HYSTERIA; NERVOUS SYSTEM.)

NURSING, DOMESTIC.—*See* SICK NURSING.

NUTMEG.—Nutmeg is the kernel of the seed of a plant which grows in the East and West Indies. The covering of the nutmeg is mace. The oil of nutmeg as well as the nutmeg itself is much used in cookery because of its aromatic flavour. The oil is sometimes included in sleeping draughts.

NUX VOMICA.—The dried ripe seeds of the nux vomica plant, which grows in India and Ceylon, contain several alkaloids, the most important being strychnine and brucine. Nux vomica, in small doses, is a bitter tonic which stimulates gastric digestion. (*See also* STRYCHNINE.)

NYCTALOPIA.—This is another name for night-blindness. (*See also* NIGHT-BLINDNESS.)

NYSTAGMUS.—A condition in which the eyes are continually moving in a jerky manner, either from side to side, up and down, or round about. Nystagmus, as this condition is called, usually affects both eyes and is caused by disturbance of the semi-circular canals (organ of balance), or by some disease of the nervous system. (*See also* EYE.)

OBESITY is either a disgrace or a disease. That is a crude but accurate way of stating the plain fact that people who are too fat have become so either by reason of over-eating or because there is something wrong with them.

The difference is obvious to anybody. Some fat people are fat all over: round chubby face, small fat nose, short neck and double chin, thick fat arms, fat body, fat legs, podgy hands and feet like a baby: in short, in them the fat is evenly or fairly evenly distributed. But you will easily remember some woman whose chest is enormous, shoulders and body large, arms medium, but hips thin and flat and thin legs; or some middle-aged man with lined, small square face, thin neck, thin arms, thin legs, and big fat belly! If people are too fat why does it not get laid on all over the same as in the ordinary fat, round, chubby person?

These two different kinds of fat people are called *exogenous*, that is, coming from outside; and *endogenous*, that is, coming from inside. This means just that in the one case too much is taken in, which is simple over-eating, and in the other case the control of what is taken in, whether too much or too little, is out of gear and deals with the intake in an unusual way.

Exogenous Obesity.—Too much fat, whether from one reason or another, is a very serious and real danger, so much so that no insurance company will take people who weigh much outside the average limit. Why? Because they know from experience that fat people seldom live to a good old age. Every

pound of excess fat may mean a month less of life. And worse than merely shortening life, it makes the fat person suffer far more because he gets ill more easily, catches more troubles and has less capacity to fight the ills the flesh is heir to.

It must not be imagined that there is no fat in the healthy human body or that it is not useful. On the contrary, fat is present nearly everywhere throughout the body, from the brain to the soles of the feet. It is fat that covers over the body under the skin and keeps us warm; that, indeed, is one of its principal functions.

Another important function of fat in the body is to act as "padding." Stamp your foot on the ground: you are not hurt. A cushion of fat is conveniently placed where it is most needed, not only on the feet we walk on, or the buttocks we sit on, but inside the bone-marrow to support the arteries and veins; around the heart and lungs to support and cushion them; around the intestines to cover them and keep them warm and in their right places; around the kidneys to pad them up; throughout the muscles to keep them separate and comfortable, and in the joints to keep them from jarring on movement.

But this distribution of fat in so many places only makes it more dangerous when there is too much. For it increases around the heart till it forms a clogging blanket, pressing and weighing upon it and interfering with every beat it tries to make. Worse than that, it insinuates itself in amongst the fibres of the heart-muscle, damaging them and bringing on heart-disease. It increases around the lungs, clogging them so that the sufferer gets short of breath easily.

It weakens the muscles and clogs the joints. It interferes with the circulation; it clogs up the brain; it steals into the kidneys, interfering with their important work, and it gives the unfortunate portly person a great heavy mountain of fat to carry round all the time.

But why, one may ask, does eating too much only add on fat? Why does it not make muscle, and bone and sinew? The reason lies in still another valuable purpose of fat, which is to store reserve food. Nature has wisely arranged that we can store up in our bodies a reserve against a rainy day. The fat deposit acts as a sort of banking account.

This storage capacity of food (in the form of fat) is of course greater in women than in men. A woman needs much more reserve food material than a man just because she has to be ready to support a voracious hungry child. The greater capacity of women to store up a reserve of food is one of the reasons why women in middle life tend more easily to get fat than men. The storage capacity is great and it is not being used, but they go piling up reserves all the time by eating far more than they need.

Over-eating is very common, far too common. Savages very seldom get fat, partly because they do not get such nice food, so nicely cooked, nor so many meals a day, and partly because they have to take far more exercise. The sedentary, dull city life tends to make civilized human beings eat a lot, but not to use up what they eat. The brain-worker needs far less food than the labourer. But the brain-worker—having more money—can buy more and nicer food, and so of course he gets fat much quicker.

Habit has a lot to do with it. We all get into the way of eating four times a day, with very often sweets or snacks in between. And the poor stomach has been so hard-worked since childhood that it has got accustomed to having to handle large masses of food all the time. It hardly ever gets a rest.

Then the unfortunate habit of "stimulants," that is, alcohol, which does not stimulate but really irritates the weary stomach and encourages it to take more food. Alcohol has its uses, but its abuse at mealtimes acts as an insidious introduction to the other equally unpleasant vice of over-eating.

Certain foods are much more fattening than others. But, curiously enough, it is not the fats that are fattening, it is the starchy foods; bread, cakes, potatoes, sugar, plums, prunes, bananas, puddings. And it is just these that form the staple of all meals and are so convenient at odd times. Sugar, bread and potatoes are the chief offenders. It is these that should be restricted, and it will be noticed that in the diets included, these are carefully regulated. It is the purpose of the sugars and the starches to provide physical energy; when they are not actually needed, as in lack of sufficient physical exercise and fresh air, then they are carefully stored up by the body in the form of fat.

Diet is essential in reducing weight. The amount of food taken has to be strictly in proportion to the work (physical) done and in the fat person the intake should be reduced below that level. This is done so as to get fat people to draw on the reserves they have carefully stored up—in short, to spend some of their spare capital of food. But it is not capital in the sense of an asset; it is a dangerous overdraft on the bank of health.

Fat reduction is a very personal and often a very difficult thing. It requires exact knowledge of the case, exact and careful dieting, and means, in short, trouble on the part of both doctor and patient.

The Banting diet in particular should never be tried without advice first, though a day's fast now and then will never hurt any ordinary person and might be wisely practised by everyone.

Endogenous Obesity.—This type of obesity is due to certain diseases involving the internal glands of the body: the thyroid, the pituitary, the ovaries, the testicles, the suprarenal, etc. Disturbance of the ovarian function at the menopause or change of life often leads to abnormal deposits of fat in women. Most young people who get fat do so by reason of some defect of the glands. There are, of course, many types and conditions, but it is important to observe that such cases are due to ill-health and disease. The disease may be encouraged and assisted by over-feeding; but that is not the primary error, though it may be an accompanying factor. These cases are difficult and require skilled and careful attention, not only to remove the fat but to correct the other symptoms of disease that are commonly present. No such case should be allowed to experiment with diets or medicines or drugs; they require very careful and very serious treatment, as they are the unfortunate sufferers of a serious and unsightly illness.

The hereditary tendency to fat so often seen in families is usually associated with a glandular error. How common such troubles are may be illustrated by the statement that it is estimated 40 per cent. of fat people have a hereditary history. Minor errors are of course common, and serious cases are not so often seen, but the fact that this type of obesity is essentially due to disease must be emphasized.

Diet No. 1.—*The Banting Diet.*—Banting himself suffered from an extreme degree of obesity. Under the advice of a medical friend named Harvey, he adopted a special régime with such success as to lose 35 lb. in thirty-eight weeks. He subsequently published the system in 1863 and it is well known under his name.

The diet is essentially a form of starvation, as it, practically speaking, comprises protein food alone.

The following is a modernized version of the diet. The original requires to be slightly altered, as "1 to 3 glasses of good claret, sherry or madeira" are given a prominent place!

On Waking.—A tumbler of hot water, sipped, to which some fresh lemon or orange juice may be added.

Breakfast.—One small cup of tea or coffee, sweetened with saccharine; no cream, no milk.
1 oz. dry toast; no butter.
4 oz. lean grilled meat or bird or cold meat, and 3 oz. of grilled or boiled fish.
Raw fruit.

Half an hour before lunch.—Three-quarters of a tumbler of water.

Lunch.—3 oz. lean beef, lamb, chicken or game (hot or cold, roast or boiled); gravy must be free from fat.
4 oz. of any vegetable as given below, plainly boiled, without butter, lard, or oil; raw salad, which must be without oil.
Two or three water biscuits; 2 oz. of toasted wholemeal bread.
One glass of water.
Small cup of coffee, without sugar, milk or cream.
Raw fruit.

Tea.—A cup or two of tea without milk or sugar and one water biscuit.

Half an hour before dinner.—Three-quarters of a tumbler of water.

Dinner.—3 oz. of any fish, as at breakfast.
4 oz. of any meat, as at lunch. (If chicken or game is taken, it must be without bread-sauce or crumbs.)
4–6 oz. of any vegetable as mentioned below; salad and biscuit as at lunch.
2 oz. of toast.
Water, as at lunch.
A cup of black coffee.
Raw fruit.

Salads and Vegetables Allowed.—Watercress, radishes, lettuce, cucumber, mustard and cress, spinach, asparagus, celery, brussels sprouts, cabbage, cauliflower, vegetable-marrow, kidney or French beans, tomatoes, artichokes.

Anything not mentioned above may be assumed to be forbidden. The above amounts are merely suggestions. The less eaten the better.

Diet No. 2.—The following is a simplified form of a reducing diet freely used by the writer. It will be noted that it reduces the

fluid intake as well as food. The total calorie value is about 1,400.

On Waking.—½ cup of hot water or tea.
Breakfast.—½ cup of tea or coffee; one tablespoonful of milk. No sugar.
1 oz. toast bread, or Vita-weat. Limit butter.
1–2 oz. fish, if desired.
Grapefruit or an apple or an orange.
Lunch.—A small portion of meat, fish or bird.
4–6 oz. cooked green vegetables, i.e., a large helping.
1 oz. Vita-weat or toast. Limit butter.
Up to 1 oz. cheese (cream), if desired.
2–3 oz. stewed fruit (cooked without sugar) sweetened with saccharine.
½ cup of any fluid.
Tea—1 cup of tea to drink with milk only.
Dinner.—(Soup ½ cup).
Meat, fish, bird or egg dish.
4–6 oz. green vegetables.
Stewed fruit; no sugar.
Junket or baked custard (small helping).
1 oz. Vita-weat or toast.

It is important that the diet should be followed exactly, nothing being taken beyond it, and nothing omitted from it.

Table showing Average Weights of Adults 16 to 50 years old for given Age and Height.

FEMALES.

(Height in feet and inches, taken in shoes.) (Weight in stones and lb.)

Age.	4 8	4 10	5	5 2	5 4	5 6	5 8	5 10	6
16	6 12	7 2	7 5	7 10	8 2	8 10	9 4	9 11	10 7
17	6 13	7 3	7 7	7 12	8 4	8 11	9 5	9 12	10 8
18	7 0	7 4	7 8	7 13	8 5	8 12	9 6	9 13	10 9
19	7 1	7 5	7 9	8 0	8 6	8 13	9 7	10 0	10 9
20	7 2	7 6	7 10	8 1	8 7	9 0	9 8	10 1	10 10
21	7 3	7 7	7 11	8 2	8 8	9 1	9 9	10 2	10 10
22	7 3	7 7	7 11	8 2	8 8	9 2	9 9	10 3	10 11
23	7 4	7 8	7 12	8 3	8 9	9 2	9 10	10 4	10 11
24	7 5	7 9	7 13	8 3	8 9	9 2	9 10	10 4	10 12
25	7 5	7 9	7 13	8 3	8 10	9 3	9 11	10 5	10 12
26	7 6	7 10	8 0	8 4	8 10	9 3	9 12	10 5	10 13
27	7 6	7 10	8 0	8 4	8 11	9 4	9 12	10 6	10 13
28	7 7	7 11	8 1	8 5	8 12	9 5	9 13	10 7	11 0
29	7 7	7 11	8 1	8 5	8 12	9 5	9 13	10 7	11 0
30	7 8	7 12	8 2	8 6	8 13	9 6	10 0	10 8	11 1
31	7 9	7 13	8 3	8 7	9 0	9 7	10 1	10 8	11 1
32	7 9	7 13	8 3	8 7	9 0	9 8	10 2	10 9	11 2
33	7 10	8 0	8 4	8 8	9 1	9 9	10 3	10 10	11 2
34	7 11	8 1	8 5	8 9	9 2	9 10	10 4	10 11	11 3
35	7 11	8 1	8 5	8 9	9 2	9 10	10 4	10 11	11 3
36	7 12	8 2	8 6	8 10	9 3	9 11	10 5	10 12	11 4
37	7 12	8 2	8 6	8 11	9 4	9 12	10 6	10 13	11 5
38	7 13	8 3	8 7	8 12	9 5	9 13	10 7	11 0	11 6
39	8 0	8 4	8 8	8 13	9 6	10 0	10 8	11 1	11 7
40	8 1	8 5	8 9	9 0	9 6	10 0	10 8	11 1	11 7
41	8 2	8 6	8 10	9 1	9 7	10 1	10 9	11 2	11 8
42	8 2	8 6	8 11	9 1	9 7	10 1	10 9	11 2	11 9
43	8 3	8 7	8 11	9 2	9 8	10 2	10 10	11 3	11 10
44	8 4	8 8	8 12	9 3	9 9	10 3	10 11	11 4	11 11
45	8 4	8 8	8 12	9 3	9 9	10 3	10 11	11 4	11 11
46	8 5	8 9	8 13	9 4	9 10	10 4	10 12	11 5	11 12
47	8 5	8 9	8 13	9 4	9 10	10 5	10 13	11 6	11 13
48	8 6	8 10	9 0	9 5	9 11	10 6	11 0	11 7	12 0
49	8 6	8 10	9 0	9 5	9 11	10 6	11 1	11 8	12 1
50	8 7	8 11	9 1	9 6	9 12	10 6	11 1	11 9	12 2
55	8 7	8 11	9 1	9 6	9 12	10 7	11 3	11 10	12 3

Table showing Average Weights of Adults 16 to 50 years old
for given Age and Height.

MALES.

(Height in feet and inches, taken in shoes.) (Weight in stones and lb.)

Age.	5		5	2	5	4	5	6	5	8	5	10	6		6	2	6	4
16	7	1	7	6	7	12	8	6	9	0	9	8	10	4	11	0	11	10
17	7	3	7	8	8	0	8	8	9	2	9	10	10	6	11	2	11	12
18	7	5	7	10	8	2	8	10	9	4	9	12	10	8	11	4	12	0
19	7	7	7	12	8	4	8	12	9	6	10	0	10	10	11	6	12	2
20	7	9	8	0	8	6	9	0	9	8	10	2	10	11	11	7	12	3
21	7	10	8	1	8	8	9	2	9	9	10	3	10	12	11	8	12	4
22	7	11	8	2	8	9	9	3	9	10	10	4	10	13	11	9	12	5
23	7	12	8	3	8	10	9	4	9	11	10	5	11	0	11	11	12	7
24	7	13	8	4	8	11	9	5	9	12	10	6	11	1	11	13	12	9
25	8	0	8	4	8	11	9	5	9	13	10	7	11	3	12	1	12	11
26	8	1	8	5	8	12	9	6	10	0	10	8	11	4	12	2	12	13
27	8	2	8	6	8	12	9	6	10	0	10	8	11	5	12	3	13	0
28	8	3	8	7	8	13	9	7	10	1	10	9	11	6	12	4	13	1
29	8	4	8	8	9	0	9	8	10	2	10	10	11	7	12	5	13	2
30	8	4	8	8	9	0	9	8	10	2	10	11	11	8	12	6	13	4
31	8	5	8	9	9	1	9	9	10	3	10	12	11	9	12	7	13	5
32	8	5	8	9	9	1	9	9	10	4	10	13	11	10	12	8	13	6
33	8	5	8	9	9	1	9	9	10	4	11	0	11	11	12	9	13	7
34	8	6	8	10	9	2	9	10	10	5	11	1	11	12	12	10	13	8
35	8	6	8	10	9	2	9	10	10	5	11	1	11	12	12	11	13	9
36	8	7	8	11	9	3	9	11	10	6	11	2	11	13	12	12	13	10
37	8	7	8	11	9	4	9	12	10	7	11	3	12	0	12	13	13	11
38	8	8	8	12	9	4	9	12	10	7	11	3	12	1	13	0	13	12
39	8	8	8	12	9	4	9	12	10	7	11	3	12	1	13	0	13	13
40	8	9	8	13	9	5	9	13	10	8	11	4	12	2	13	1	14	0
41	8	9	8	13	9	5	9	13	10	8	11	4	12	2	13	1	14	1
42	8	10	9	0	9	6	10	0	10	9	11	5	12	3	13	2	14	2
43	8	10	9	0	9	6	10	0	10	9	11	5	12	3	13	2	14	2
44	8	11	9	1	9	7	10	1	10	10	11	6	12	4	13	3	14	3
45	8	11	9	1	9	7	10	1	10	10	11	6	12	4	13	3	14	3
46	8	12	9	2	9	8	10	2	10	11	11	7	12	5	13	4	14	4
47	8	12	9	2	9	8	10	2	10	11	11	7	12	5	13	5	14	5
48	8	12	9	2	9	8	10	2	10	11	11	7	12	5	13	5	14	5
49	8	12	9	2	9	8	10	2	10	11	11	7	12	5	13	5	14	5
50	8	12	9	2	9	8	10	2	10	11	11	7	12	5	13	5	14	5
55	8	13	9	2	9	9	10	3	10	13	11	9	12	6	13	6	14	6

OBSESSION is a thought, feeling or impulse, which in spite of the efforts of the will of a person, forces itself upon the mind, thus interfering for a time with the regular course of the person's thoughts. Obsessions are of three kinds:

Obsessions of Indecision.—These occur in normal people to a mild degree. We have all experienced the feeling of doubt sometimes as to whether we have locked the door at night, or have remembered to switch off a light, and have gone back to make sure. One return and we are satisfied that all is in order; not so the patient with an obsession of indecision. He will go back again and again to re-assure himself that all is dark and safe. Even repeated assurances fail to remove from his mind the doubt that something remains to be done. Anything which serves to raise a doubt in his mind will serve

to produce an obsession of indecision in one disposed to this disorder. And intense mental distress accompanies the period of indecision.

Obsessions of Fear.—*See* PHOBIAS.

Obsessions of Impulse cause their victims to have irresistible impulses to commit certain acts, which only too often bring them into contact with the law. For this reason, for their own protection as well as for that of others, those who suffer from such obsessions are safer in institutions. Examples of common obsessions of impulse will illustrate this point: *pyromania* is the impulse to set things on fire. It does not matter to the culprit whether he burns a haystack or a palace; it is all the same to him, and he has no feeling of guilt about it. *Kleptomania* is the impulse to steal, and is a real obsession when the article stolen is of little value compared with the patient's means. It is important to realize that although at the time the impulse is uncontrollable and the stealing of something worthless or the setting fire to a building is attempted, yet once the period of the impulse is over for the time being, the culprit is overcome with shame and terror. It is obvious that such people cannot be treated as criminals, but may be judged insane and treated accordingly.

OBSTETRICS.—The branch of medicine which deals with pregnancy and childbirth is known as midwifery or obstetrics.

OBSTRUCTION.—When the term obstruction is used it generally refers to obstruction of the bowels; but obstruction may also occur in the bile ducts or the urinary tract. The causes of obstruction of the bowel are various. There may be a gall-stone embedded in the intestine or there may be a kink in the gut due to adhesions. Tumours are a very common cause; also intussusception, a condition in which one part of the intestine slips into the part beyond. Obstruction immediately takes place in cases of strangulated hernia and there is absolute constipation accompanied by distention of the abdomen. In cases of obstruction where there is interference with the blood-supply, the need for operation is usually urgent, for intestine thus left without its blood-supply rapidly dies.

Symptoms.—The patient is suddenly seized with severe pain in the abdomen which, as a rule, causes vomiting to take place. The colicky pains gradually get worse and the patient usually looks extremely ill. The doctor should be sent for immediately and no purgatives should be given in the meantime, otherwise damage may be caused. (*See also* BOWEL; CALCULUS; INTUSSUSCEPTION.)

OCCIPUT.—The back part of the head is called the occiput. (*See also* HEAD.)

OCCLUSION.—A closing or shutting up is referred to as occlusion. For example, when the upper and lower jaws are at rest and in contact with each other, it is called an occlusion of the teeth.

OCCUPATIONAL DISEASES.—Most occupations have some little irregularities which may interfere with good health yet not seriously damage it. On the other hand, there are occupations or trades which definitely lend themselves to certain diseases and forms of poisoning, but workers in poisonous substances are now protected under the Factory and Workshops Acts in Great Britain. Workers in lead, which is used in many trades, have to be specially protected against poisoning, also workers who handle arsenic, phosphorus, mercury, and those exposed to the fumes of india-rubber.

Wool-sorters are liable to suffer from a condition known as anthrax, which is caused by a germ getting into cuts or abrasions in the hands due to working with fleeces. Glass-blowers may suffer from bronchitis and lung trouble on account of the strain entailed in their work. Clergymen, along with other public speakers, suffer from a special type of throat complaint known as clergyman's sore throat. Stone-cutters, steel-grinders, cotton-workers and flour-millers are liable to contract consumption through inhaling irritating particles. Divers, and those who work under compressed air, may suffer from pains in the limbs which sometimes leads to paralysis. Occupational cramp is due to a spasm of a group of muscles which are excessively used in the daily work; some such occupations include writing, type-writing, type-setting and telegraphy, etc. Skin complaints play a very important part in occupational diseases and the following article deals with the matter quite fully. (*See also* ANTHRAX; CAISSON DISEASE; CLERGYMAN'S SORE THROAT; LEAD POISONING; NEURITIS.)

OCCUPATIONAL SKIN DISEASE (Dermatitis).—This is one of the commonest

forms of dermatitis or skin disease (q.v.), and since it is so frequently found, and is of such enormous practical importance—not only to the individual, but to the various trades concerned—it is considered separately.

It is due to contact with any irritating dust or liquid with which the patient comes into contact at his work. Washerwoman's eczema, bricklayer's and baker's itch, etc., are old familiar names; but surgeons, pathologists, workers with morphine and other drugs, printers, silver-platers, photographers, dyers, tanners, furniture polishers, rubber workers, coal and shale miners, chimney-sweeps, builders, plasterers, carpenters, housewives, packers, and others are all liable. Some silk-winders are affected by the raw silk in the cocoon; barmen and others who have to wash beer and wine-glasses suffer from the effects of the decomposing alcohol and weak acids in the "dregs." Many drugs besides morphine are responsible for dermatitis in those who prepare them, especially quinine, aconite, podophyllin, rue, vanilla, oil of bitter orange, and other aromatic oils. "Tar acne" is well known among gasworks men and others who work with tar, and a similar condition occurs among paraffin workers. Workers in garages sometimes suffer from petrol irritation on the leg from carrying tins full of petrol, and allowing this to splash on to the leg. These are only a few examples from the enormous number of recorded occupational dermatitis.

Some substances are far more liable to produce dermatitis than others. Some, on the other hand, seem only to cause irritation when the worker is in a low state of health, as after influenza, or if anæmic; these have the effect of lowering his resistance and rendering him liable to infection. He may have been exposed to the particular form of irritant for many years before he became "sensitized," but after a first attack, recurrences are very liable to occur. It is a very important and unfortunate characteristic of the disease that the worker may stay away from his work and undergo treatment for some time, and the skin may become almost completely healed, and then—for no apparent reason: perhaps a lowering of the general health, perhaps a little carelessness —it breaks out again as badly as at first. It is impossible, moreover, to give any estimate of the length of time the trouble may last; it may be one, it may be twelve months; and recurrences are very likely. In many cases it is advisable for the patient to change his occupation. This may seem rather hard advice, especially to a man who has spent years at training for his particular trade, but it often saves time, trouble, and expense in the end. It is as well, however, always to have the advice of a specialist on the matter, as on the surface it may appear that an eruption is due to some irritant at work, but this is not always so. "Not every eruption from which a baker suffers is baker's itch."

Treatment.—This differs in no way from the usual methods of dealing with dermatitis, except that the worker should not be exposed to the irritant during the time of treatment. If, however, he cannot give up or change his occupation immediately, he must endeavour to protect the affected skin as far as possible. This is done by the use of an oily application, which is not easily dissolved off. The hands should be washed only once a day, preferably at night, and very well rinsed to remove every trace of soap, which often adds to the irritation. They are then dressed with a bland oil or ointment, as is described under DERMATITIS (q.v.). In the morning the hands are rubbed over with dry cotton wool, and a mixture of wax and lanolin massaged in. This may be re-applied as desired during the day. Housewives should, as far as possible, do all their "dirty work" at once, then thoroughly wash and rinse the hands, dress them as directed, and endeavour to keep on the dressings for the rest of the twenty-four hours. Some other workers, such as washerwomen and photographers, may keep on with their occupation if they can replace the irritant substance with another equally good. For instance, one particular washing-powder may give rise to irritation, or one particular developer, but it is often found that another brand of soap, or another variety of developer, causes no irritation whatever.

The subject of occupational dermatitis is very wide, and it is impossible here to give more than a brief and incomplete summary. It may, however, be of interest to consider one trade—that of coal-mining—in more detail, as an example of the varieties of dermatitis that may occur in *susceptible* workers. Not every coal-miner, is attacked.

"Water-rash" is fairly frequent among coal-miners. Water, on filtering through the earth into the pit, dissolves many irritating substances; sulphuretted hydrogen and sulphur dioxide, both irritating gases, are present in the air of the mine, and are also dissolved. With constant wetting from this water, an itching moist dermatitis develops on the parts exposed to it.

Creosote rash also occurs. The wooden props used in mines are soaked in creosote or similar substances to preserve them from the effects of water, and to prevent the growth of fungi upon them; they are called "pickled props" by the men, and the process of placing them in position as "timbering." The form of dermatitis produced by these is usually seen in youths who are new to the mine, and who have spent a week or two handling the "pickled props." Their hands, wrists, and forearms first become pimply, then little blisters form, which go on to pustules or small abscesses.

A third form of dermatitis occurs, which is true occupational dermatitis, but may be against the damp sweating skin. It is not a true occupational dermatitis, but may be included here as an example of irritation occurring as a result of dirty heating work, but not directly due to a *special* irritant. It occurs in hewers, i.e. the men who "pick down" the coal. The armpits, and any other places where one part of the skin rubs against another, are affected. Right-handed hewers rest the right forearm inside the right thigh, and left-handed hewers the left, as they work; these surfaces are very commonly affected. The genital region is also frequently affected, as many of the men leave this area uncleansed in their daily wash.

The skin is first chafed, and feels hot and sore, then the surface becomes rubbed off, and fluid is poured out upon it. If the condition goes on, softening of the skin occurs, so that it peels off in large flakes, and has a very offensive odour. If still neglected, it may become general over the whole body. It may be noted, however, that no case of cancer from coal-dust irritation has been recorded, though the soot cancer of chimney-sweeps is, or was, well known. This form of dermatitis may be prevented by cleanliness, and may be cured by the same means, i.e., by a thorough wash all over each day. As part of the cure, a little boric acid added to the bath assists in preventing infection; carbolic oil (1 in 30) is a useful dressing; and absence from work hastens the cure.

Finally, a "sweat rash," which affects other workers, though it is notably common among miners, is caused by the painstaking efforts of the dirty sweating skin to throw off internal poisons in addition to waging warfare against its foes outside. This "dermatitis" is cured by a good dose of calomel.

ODONTALGIA.—This is another name for toothache.

ŒDEMA.—The swelling which occurs in dropsy is known as œdema. There is an accumulation of watery fluid beneath the skin, and indentations or pits can be made in the flesh by pressing with the finger. (*See also* DROPSY.)

ŒSOPHAGUS.—The œsophagus is the tube by which food is conveyed down the throat to the stomach. (*See also* GULLET.)

OIL.—Oil is a thick liquid obtained from a vegetable, animal or mineral source. The two main types of oils are fixed oils and volatile or essential oils. Fixed oils are also called fatty oils because they are made up of animal and vegetable fats. Some are liquids such as olive oil, castor oil, and linseed oil, etc., while solids such as tallow and beeswax belong to the same group. Essential oils are so called because they contain the essence or active principle of a plant. Examples of these oils are oil of eucalyptus, peppermint, anise, dill, etc. (*See also* ESSENTIAL OILS.)

OINTMENTS.—A fatty substance, rather like butter, to which drugs have been added and which is used for application on the skin is called an ointment. Lard, benzoated lard, paraffin, vaseline and lanolin (a fat obtained from sheep's wool) are the usual substances used as a base. Ointments are only intended for external use, and it is unwise to put any on a wound or sore from which there is much discharge as this will tend to prevent proper drainage.

OLD AGE.—*See* AGE CHANGES.

OLEIC ACID.—An oily liquid greatly used along with drugs which it is desired to apply to the skin. Oleic acid penetrates the skin more readily than fats and oils. Any substance which has oleic acid as a base is termed an oleate.

OLFACTORY NERVE.—The first cranial nerve, the nerve of smell, is also known as the olfactory nerve. (*See also* NOSE.)

OLIVE OIL.—The oil obtained from ripe olives which is pale greenish-yellow in colour, is one of the most commonly used oils we have. It is much used as an article of food and can provide nourishment if vigorously rubbed into the skin. This is an excellent way of providing babies with extra nourishment and it also helps to keep the skin smooth. It is given freely by mouth in certain cases of poisoning as it is very soothing to the mucous membranes. It is a mild laxative, and for this purpose it can be given with food such as salads, etc. An enema of warm olive-oil may be injected into the bowel in order to relieve severe constipation. It often gives relief to patients who have gall stones, and is of great value in the treatment of colitis. It serves as an ingredient of liniments, ointments and plasters.

OMENTUM.—A long fold of the peritoneum which hangs down over the intestine is known as the omentum. It is more or less loaded with fat, and it is the increasing deposit of fat on this structure that causes the abdomen to increase in size. This part of the structure is known as the great omentum to distinguish it from two smaller peritoneal folds. (*See also* OBESITY.)

OMPHALUS.—This is another name for the navel or umbilicus.

ONYCHIA.—A disease of the nails in which inflammation takes place is known as onychia. The nail usually becomes discoloured and is thrown off, but is replaced by the growth of a new one. (*See also* NAILS.)

OPEN-AIR TREATMENT.—Cases of tuberculosis are treated as much as possible in the open air, as it is a well-recognized fact that a free circulation of air around the body is a necessary part of the cure. Sunlight, too, is very important in restoring health to those suffering from this disease. (*See also* LIGHT THERAPY; TUBERCULOSIS.)

OPHTHALMIA.—Inflammation of the eye. The term ophthalmia is often used in place of conjunctivitis. (*See also* CONJUNCTIVITIS; EYE.)

OPHTHALMOSCOPE.—An instrument for examining the interior of the eye is called an ophthalmoscope. It consists of a mirror with a hole in it through which the doctor looks and light is thrown into the eye from the mirror. (*See also* EYE.)

OPIUM.—Opium is perhaps the best known of all the narcotic (sleep-producing) drugs and it is the oldest and most certain remedy for pain. It is the dried juice of the unripe seed-capsules of the white poppy and it contains a large number of alkaloid substances, at least eighteen in number, of which the following are the most important: morphine, codeine, narcotine and thebaine. Poppies are cultivated to a large extent in India, Persia and China and also in parts of Turkey, and they have to be grown under special climatic conditions, otherwise the opium loses its peculiar properties. The opium from different parts of the world varies a great deal in strength, but good opium should contain about ten per cent. of morphine, or morphia, to which it chiefly owes its action. The opium obtained from Turkey is considered to be the purest in morphia, and is best suited for medical work; the Indian and Persian opium contains a large proportion of narcotine which is apt to cause sickness.

Although opium is used a great deal in medicine, its sale is restricted because it comes under the Dangerous Drugs Act. It is a very harmful drug and a craving for it is readily established. Large doses in a person unaccustomed to the drug are liable to cause death. There are many preparations made from opium including such well-known ones as Dover's powder, laudanum and paregoric, etc.

In its action, opium at first causes mental excitement, but this is soon followed by sleep which may be accompanied by pleasant dreams. It is excellent for giving immediate relief from pain, but it is not advisable to give it in cases of appendicitis as there is the danger of hiding symptoms and delaying an operation which may require urgent carrying out. Opium is generally used in the form of laudanum for outward application in fomentations Lumbago, inflammation of the joints and such-like pains do very well treated in this way. Looseness of the bowel is also well treated by laudanum, as it arrests diarrhœa and dysentery. Cough mixtures frequently contain opium as it tends to lessen cough; and Dover's powder, which is a mixture of opium and ipecacuanha, is often useful in checking a common cold. (*See also* DRUG HABITS.)

OPIUM POISONING.—Poisonous doses of opium may cause slight excitability at first, but very soon a feeling of intense drowsiness

sets in. This is rapidly followed by loss of movement and sleep, and finally unconsciousness from which it is impossible to arouse the patient. The face becomes blue and the skin cold, although there may be a great deal of perspiration. The pupils of the eye contract until they are almost pin-points. The breathing gradually becomes slower and more irregular and, unless treatment has been administered, the patient dies.

Treatment.—It is sometimes difficult to tell the difference between opium and alcohol poisoning, but the pupils are more contracted in poisoning by opium and the patient is more easily roused in alcohol poisoning. An emetic should be given as soon as possible, and in addition the stomach should be washed out with a solution of permanganate of potassium. The patient must be roused and kept awake by walking him up and down, pinching him, or flapping him with a wet towel. Strong coffee should be given and if he is unable to swallow it, it should be injected into the rectum. If necessary, artificial respiration should be employed.

Those who are in the habit of taking opium or morphia may suffer from a state of chronic poisoning. There is loss of appetite, indigestion, sluggish bowels, and anæmia. These victims rapidly degenerate and lose all sense of right and wrong. The patient should be kept under constant care and watched to see that no drug is obtained. (*See also* DRUG HABITS.)

OPTIC NERVE.—The second pair of cranial nerves are called the optic nerves and they connect the eye with the brain. (*See also* EYE; FIELD OF VISION.)

ORANGE.—Orange juice, on account of the vitamin it contains, is a very important as well as a pleasant article of diet. It is given to infants to prevent infantile scurvy. Preparations of the peel, both fresh and dried, are used for flavouring puddings and cakes. Bitter oranges are used to make marmalade, which serves as an appetizer at breakfast.

ORBIT.—The bony cavity which contains the eye is called the orbit. (*See also* EYE.)

ORCHITIS.—Inflammation of the testicle is known as orchitis. When the infection spreads along the cord it is known as epididymitis. (*See also* EPIDIDYMITIS; TESTICLE.)

ORGANIC DISEASE.—Disease of an organ which causes an alteration in the workings of the body is said to be an organic disease. A disease in which no such changes can be found is said to be functional.

ORGANO-THERAPY.—Treatment of disease by the administration of animal organs or extracts of them, such as thyroid gland, insulin, adrenalin, pituitrin, etc., is known as organo-therapy. (*See also* DUCTLESS GLANDS.)

ORIENTAL SORE.—A disease of the tropics in which ulceration takes place is known as oriental sore, Delhi boil, Aleppo button and various other names. (*See also* ALEPPO BUTTON.)

ORTHOPÆDICS.—This is the term given to a branch of surgery which deals with the correction of deformities.

OSMOSIS.—The passage of fluids through a membrane is known as osmosis. Osmotic pressure is the term applied to the pressure exerted by the fluid to pass through the membrane.

OSSIFICATION.—The formation of bone is called ossification. Very early in life the bones are represented by cartilage and fibrous tissue and from these the true bones gradually develop. While the child is still in the mother's womb ossification is going on all the time and at birth considerable progress has been accomplished, but it is not until about the age of twenty that complete ossification occurs. (*See also* BONE).

OSTEITIS.—A chronic disease of the bones which does not commence until late in life is known as osteitis, or Paget's disease of the bones. The bones usually show signs of softening which alters their shape to a certain extent, but subsequently they harden, leaving them in a deformed state such as curvature of the spine, curvature of the bones of the leg, and enlargement of the head. The condition develops very slowly and as the health is not in any way affected, the patient may not notice any change in himself other than requiring a larger size in hats. Gradually the bones of the legs alter in shape and the other bones of the body may alter accordingly. In rare cases the changes are limited to a single bone, but even in severe cases the hands and feet remain unaffected. The cause of the disease is not known, but a patient may live for twenty or thirty years after onset of the condition. There is no specialized treatment, but aspirin will be found helpful in relieving any pains. (*See also* BONE; OSTEOMYELITIS.)

OSTEO-ARTHRITIS.—A disease in which there is inflammation in the joints and in which changes take place in the bones. (*See also* RHEUMATOID ARTHRITIS.)

OSTEOMALACIA.—This is a condition of the bones in which, owing to a lack of calcium, they become softened and are liable to break. It may be due to a lack of the proper vitamins in the diet, especially vitamin D, or to a lack of sunshine and a deficiency of calcium in the blood. It occurs usually in women and, as the bones of the pelvis and spine are the ones most commonly affected, it naturally follows that this condition interferes very seriously with childbirth.

Treatment.—The patient should be given cod-liver oil and put on a diet rich in calcium and phosphorus obtained from eggs, milk, fish and vegetables. As much sunshine as possible should be obtained and unhygienic surroundings should be avoided. (*See also* BONE.)

OSTEOMYELITIS. — This condition is most commonly met with in children between the ages of three and fourteen, but it may also occur in adults. The term osteomyelitis means inflammation in the marrow of a bone and it is caused by infection either in the blood itself or by means of an injury to the skin through which the germs have penetrated.

Symptoms.—Severe pain is usually felt in the bone (usually a leg bone) and the neighbouring joints may feel painful and tender. Very shortly after the first symptom of pain, the patient begins to feel ill, and there may be high temperature and swelling of the affected limb. If an operation is not carried out immediately, pus will collect and a large abscess will form, which will gradually make its way through the tissues to the skin. In some cases the abscess may burst or spread into a neighbouring large joint, and a severe state of poisoning may be set up.

Treatment.—Operation must be carried out as soon as possible, otherwise there is the possibility that the child may die from septicæmia, or blood-poisoning, or the bone of the leg may be permanently damaged. The operation consists of boring through to the bone in order to allow the pus to discharge freely. (*See also* BONE.)

OTITIS.—Inflammation of the internal or external ear is called otitis. (*See also* EAR.)

OTORRHŒA.—A discharge from the ear is known as otorrhœa. (*See also* EAR; MASTOID.)

OTOSCLEROSIS.—A type of deafness in which changes occur in the bony walls of the labyrinth or internal ear is known as otosclerosis. There are usually noises in the ears and deafness gradually becomes worse as time goes on, though it seldom goes on to stone deafness. The treatment is not very satisfactory, and a specialist's advice should be sought early on. (*See also* EAR.)

OVARIES.—There are two ovaries in the female, one on each side within the pelvis, each about an inch in length and oval in shape. Each ovary is joined to the womb (uterus) by a broad band which contains within its folds a tube known as the Fallopian tube along which the tiny ovum (the microscopic egg, or female sexual element) is conveyed from the ovary to the womb. The period of menstruation takes place when an ovum is set free (at regular intervals of about four weeks) from the ovary and travels down to the womb; if it is not impregnated it escapes from the womb with the blood which comes away. Each menstruation resembles a slight pregnancy which has not been made complete through the ovum not having been impregnated. (*See also* MENSTRUATION.)

OVERFEEDING.—The danger of overfeeding, especially after middle age has been reached, cannot be too strongly emphasized. Many of the ills of later years could be avoided if the right sort of diet were taken after the age of thirty. A continual overloading of the stomach not only interferes with the proper digestion of food, but it causes the other organs of the body, such as the liver, the kidneys, the pancreas, etc., to become seriously damaged. Up until about the age of thirty these organs may be in a fit state to stand up to a little extra work, but after that age, any strain begins to weaken them considerably, so it is necessary to avoid overworking them as much as possible. (*See also* FORCIBLE FEEDING; OBESITY; and SPECIAL SUPPLEMENT ON DIET.)

OVERLYING.—In the slums and poorer districts, quite a number of children die from suffocation owing to the fact that they have been lain upon while in bed with their parents. An infant should always sleep in its own cot, and no matter how poor the

parents, one can always be made out of a suitable box.

OVUM.—An ovum is the single cell which comes from the ovary of the female, and after it has become impregnated by the male, it is capable of developing into an individual. (*See also* EMBRYO.)

OXALIC ACID POISONING.—Oxalic acid poisoning is usually the result of taking salts of lemon in mistake for Epsom salts or a like substance. Oxalic acid, or salts of lemon, are very often used for domestic cleaning purposes and, as it is similar in appearance to bicarbonate of soda and other harmless white powders, it should never be bought in larger quantity than can be used immediately, and should never be left lying around. It is a very corrosive poison, and it destroys any tissue it comes in contact with. It causes intense burning pain in the mouth, throat and stomach, followed by vomiting and collapse.

Treatment.—On no account should an emetic be given as this will only cause further irritation to the throat and stomach. Lime, chalk or whiting mixed with a little water is the best remedy and if these substances are not at hand, strip some whitewash off a wall or ceiling. Follow with a dose of castor oil, and keep the patient for three or four days on nothing but milk and lime water and give as little water as possible.

OXYGEN.—A colourless gas, odourless and tasteless, oxygen forms rather more than one-fifth of the bulk of the atmosphere. It is necessary to life, and every time we breathe we give the blood a fresh supply. Even animal and plant life under water could not exist without its presence; water consists of a chemical combination of oxygen and hydrogen.

Oxygen is prepared in large quantities for commercial purposes and it is stored in steel cylinders from which it can be obtained at any desired rate by turning a stop-cock. In many conditions the blood is not capable of carrying its normal amount of oxygen and in such cases the administration of the gas gives great relief. Pure oxygen is supplied by means of inhalation in the cases of asphyxia, especially in pneumonia, valvular disease of the heart, anæmia and poisoning. Substances such as peroxide of hydrogen, permanganate of potassium, etc., contain oxygen and are capable of giving it off. Such substances act as powerful disinfectants and they are useful in the treatment of ulcers, abscesses and various skin diseases.

OXYMEL.—An old-fashioned remedy containing honey and vinegar. Is often given in the treatment of colds or sore throats.

OXYURIS.—This is the scientific name for the tiny threadworm often found in the lower bowel of children and animals.

OZÆNA.—The unpleasant smell from the nose due to crusts forming in the interior is known as ozæna. The condition arises where there is a lack of mucous secretion and is probably due to an infection It is usually treated by nasal douches. followed by a paint containing glycerine and glucose, half and half; treatment has to be continued for months. (*See also* NOSE.)

OZONE.—Ozone is a specially concentrated from of oxygen and it is commonly supposed to be produced near the seaside and in the air of pine-clad mountains more particularly than in other districts. It has a slightly peculiar smell which may be noticed when standing near an electrical machine or dynamo, as ozone is produced by the passage through the air of electric sparks; it is produced in large quantities during a thunderstorm. (*See also* OXYGEN.)

PACK.—The application of a wet pack is a method of treatment used in certain diseases. For example, a cold pack is used to reduce the temperature in fevers and hot packs are applied in Bright's disease or nephritis, where it is necessary to make the patient sweat. The method of application is discussed under the heading COLD PACK. (*See also* BATHS; HEAT.)

PAGET'S DISEASE.—Paget's disease of the nipple is a serious condition and is discussed under the heading NIPPLE. Paget's disease of bone is a chronic disease described under OSTEITIS.

PAIN.—Different types of pain may be felt in various conditions; for example, the feeling of pain may be described as gnawing, throbbing, stabbing, burning, and so on.

Pain felt in a certain part of the body may lead to a diagnosis of some disease, but it must be remembered that disease in a certain organ often causes pain in a different part of the body owing to the distribution of nerves. This is typical of liver conditions, which often cause pain to be felt at the back of the shoulder.

Some people are able to bear pain bravely, while others become ill and faint at the mere thought of it. People suffering from hysteria very often complain of pain, and this may be accompanied by extreme supersensitiveness of the skin which makes the slightest touch intolerable.

Relief should always be given when possible, as it is undoubtedly very bad for the nervous system and very wearing to the patient to be continually under the strain of bearing pain. Drugs which afford relief are called anodynes or analgesics. The expression labour pain is used in connection with the pain felt before childbirth owing to the contraction of the womb. (*See also* LABOUR; NERVOUS SYSTEM.)

PALATE.—The arch which forms the roof of the mouth is known as the hard palate. In some people this arch is higher than in others. At the back of the mouth the fleshy part which hangs down is called the soft palate, and from the middle of the soft palate hangs the narrow projection known as the uvula. (*See also* CLEFT PALATE; MOUTH.)

PALLIATIVE.—Any treatment which is given to relieve symptoms but which does not cure the condition is said to be palliative. For example, in cases of cancer the disease may have gone too far for the surgeon to affect a cure, but palliative treatment is always administered to give the patient relief from pain.

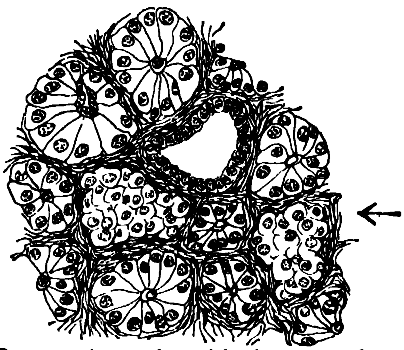
PALLOR.—Excessive pallor, or paleness, is usually a sign of anæmia, especially if the mucous membranes lining the lower eyelids are pale in colour as well. A sudden pallor may occur from faintness or fright, caused by the contraction of the blood-vessels. Pallor is not always an indication of illness, as many people are pale in appearance yet enjoy perfectly good health. (*See also* ANÆMIA.)

PALPITATION.—This is the name given to the condition where a person becomes aware of the heart beating against the chest-wall and usually beating more quickly than normal. It is not a permanent condition, but occurs in attacks lasting from a few seconds to several hours. The condition may be due to real disease of the heart muscle or valves, but is much more commonly due to some less important cause where there is no actual disease. These latter causes are very numerous and may be divided into various headings. *A dilated stomach*, distended with gas, is a very common cause of palpitations and is due to indigestion caused by overloading the stomach. The patient feels much better after "bringing up the wind"; this can be assisted by taking ginger or peppermint essence in hot water. *Womb trouble* of various kinds may be responsible, and this must, of course, be attended to by a physician. *Excessive indulgence* in tobacco, tea, coffee or alcohol is very bad for the heart as these substances act as poisons in some people.

The cure is obvious, namely, cutting down or completely stopping whatever is causing the trouble. In the matter of tobacco, no time should be lost as it is very difficult to recover from prolonged poisoning of the heart muscle caused by it, and if the heart is not working properly, the other organs of the body will suffer and the patient will never feel well. People who smoke more than about twenty cigarettes every day are storing up trouble for themselves. Pipe smoking is, as a rule, not so injurious, because not so much tobacco is smoked. With regard to excessive tea drinking it may be said that tea is not harmful if it is freshly brewed and if it is not too strong, but the tea which is harmful is that which has been brewing for half an hour and is black in colour. Coffee is more dangerous in excess than tea. Alcohol taken over long periods causes degeneration in the heart muscle and in the blood-vessels to the heart, which may lead to strokes. *Goitre*, especially the exophthalmic variety, has often palpitation as a prominent symptom.

Conditions which cause undue strain or exhaustion of the nervous system, such as puberty, menstruation, change of life, neurasthenia, hysteria, mental excitement, exhausting illnesses and acute fevers, may bring about a condition of palpitation. The immediate cause of an attack is often emotional or from excessive physical exertion.

Symptoms.—The symptoms of an attack of palpitation usually come on gradually and pass off in the same way. The patient may complain of merely a gentle beating



Pancreas: Arrow shows islands of Langerhans

against the chest, or may be conscious of a violent beating against the chest wall. There may be a feeling of great distress and pain over the heart and the patient may even have a feeling of approaching death. Sometimes faintness is complained of, and other troublesome symptoms such as flushing, noises in the ears, throbbing in the head and giddiness. The pulse rate is usually increased, though not always, but it is definitely increased by physical exertion.

Treatment.—Treat the cause, and for the immediate relief of the symptoms the patient should be reassured that the condition is not serious and should lie down with an ice-bag over the heart. A few drops of sal volatile or essence of peppermint or ginger in warm water are often of great value. (*See also* HEART).

PALSY.—This is another name for Paralysis.

PANCREAS.—The gland known as the pancreas is one of the most important organs of the body. It is long in shape, about six or eight inches in length, and lies across the back of the abdomen, directly behind the lower part of the stomach. A duct or channel runs through the whole gland and joins up with the bile-duct from the liver, which eventually opens out into the small intestine. Through this duct or channel a very necessary fluid known as the pancreatic juice passes into the small intestine. This juice contains ferments and salts which are necessary to the proper digestion of our food. Insulin is manufactured by groups of cells known as the "islands of Langerhans," which are to be found in the pancreas, and when these cells are damaged in any way the loss of insulin causes the condition known as diabetes. The pancreas of animals is also known as the sweetbread and is a particularly easily digested article of food. (*See also* DIABETES; DIGESTION; DUCTLESS GLANDS; INSULIN.)

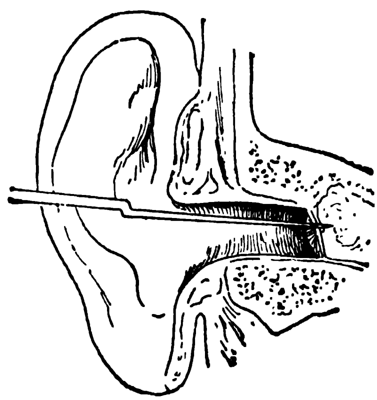
PANDEMIC.—This term is applied to an epidemic which affects the whole of a country, or district. (*See also* EPIDEMIC.)

PAPILLOMA.—A growth on the skin or mucous membrane of which a wart is a common example. These growths are usually simple in nature, which means that they are not dangerous, but there is the possibility that some may develop into malignant growths, so a doctor's opinion should be obtained. (*See also* WART.)

PAPULE.—A small, solid raised spot on the skin is called a papule, but more commonly referred to as a pimple. (*See also* PIMPLE.)

PARACENTESIS.—The operation in which the wall of a cavity is punctured in order to allow fluid to be discharged. The term is commonly used for the incision of an inflamed ear drum. (*See also* EAR; MASTOIDITIS.)

PARÆSTHESIA.—Unusual feeling in the skin such as tingling, numbness, burning or



Paracentesis (incision of ear drum)

chilliness, apart from that produced by obvious causes, is referred to as a paræsthesia. Formication is the term used for the sensation of ants running over the skin. Paræsthesia is common in some nervous diseases. (*See also* NERVOUS DISEASE.)

PARAFFIN.—The paraffins used in medicine are either hard, soft or liquid and they are obtained by distillation from shale. White and yellow vaselines are preparations made from soft paraffin, which is also known as petroleum jelly. Hard and soft paraffins are used as a basis for many ointments which are used to protect wounds or sores. Hard paraffin has recently been used in the form of a bath for the treatment of inflammation of the joints. Liquid paraffin is an excellent substance for producing an easy motion of the bowels without any griping. With some people it may pass through the bowels without bringing any motion with it, but this can be avoided by taking small doses after meals rather than one large dose before retiring. It is quite tasteless and odourless and is easily swallowed with water or orange juice.

Many other preparations are obtained from the distillation of shale oil, such as benzene, kerosene, petrol and so on. Kerosene is used for destroying lice, fleas, flies, etc., and for preventing their further attack.

PARALDEHYDE.—This is a sleep-producing drug which is very safe to give, because it is unlikely to give rise to any "habit" owing to its unpleasant taste and smell. (*See also* ANÆSTHETICS.)

PARALYSIS means loss of power of movement in a part of the body and is due to some injury to, or disease of, the nervous system. This damage to the nervous system may be either in the central nervous system, which consists of the brain and spinal cord, or in the nerves which control the movements of the limbs and face. (*See* NERVOUS SYSTEM.) The extent of any paralysis depends entirely on which part of the nervous system is damaged and to what the damage is due. Sometimes the damage is only temporary and by removing the cause of it the nerves will recover and so will the paralysis. This happens, for example, in various forms of neuritis. In infantile paralysis, which is caused by a germ attacking the central nervous system, there is usually much more paralysis in the stage of the attack itself than there is after the attack is over, because much of the paralysis during the attack is due to swelling of the spinal cord, which passes off in the late stages of the attack, leaving a certain number of dead nerve cells. It is only the movements formerly controlled by these killed nerve cells which become permanently paralysed.

Birth paralysis is due to injury to the brain at birth and may take many forms. The most common is weakness of one side of the body and of the corresponding arm and leg. Unless the condition is complicated by fits or by obvious mental changes, the outlook is good in these children. They quickly learn to make the best use possible of the affected side, and by the time adolescence is reached the majority of them suffer little inconvenience other than having to wear a special kind of boot or shoe. Another kind of paralysis which occurs in young children and is said to date from birth is due not to injury, but to a failure of certain nerve cells to develop. In these cases, both legs and both arms are stiff and weak, and queer movements, which are not under the control of the will, may be made. Fits are common, and associated with them is always some degree of mental weakness, which may vary from "backwardness" to complete idiocy. The children with few, or no, fits are mentally stronger than those which have many fits. The outlook for these children is fairly good as far as the development of the power of movement is concerned. They often improve, though never to the same extent as do the children in whom the paralysis is due to a birth injury.

Weakness or apparent paralysis of one leg or one arm in a child of school age is often due to St. Vitus's dance. It is not a true paralysis, but the child is simply disinclined to use the limb.

In adults, paralysis of one side of the body and the corresponding arm and leg is about the most common paralysis, and this is discussed under Hemiplegia. Paralysis of both legs may occur in many diseases of the nervous system, such as disseminated sclerosis and locomotor ataxia. One of the diseases of old age is paralysis agitans, or the "shaking palsy," in which there is a stiffness of the muscles of the limbs, especially of the arms with tremor first of the fingers, and later, of the whole arm. The face shares in the stiffness, the muscles being so stiff that the face appears as if in a mask, and the patient walks stiffly, with little running steps. This disease runs a very long course and may take years to develop all the symptoms described above. Weak-

ness of the muscles may appear long after the stiffness and the trembling have made recognition of the disease possible. There is no curative treatment for this disorder, but much may be done by encouraging the patient to move about as long as possible and by keeping him occupied, as the trembling ceases during voluntary movements, only to reappear when the limbs are at rest.

This "shaking palsy" also occurs in young adults as a sequel to encephalitis lethargica and it is one of the most distressing results which follow "sleepy sickness."

Certain forms of paralysis are due, not to damage to the nervous system which can be seen under a microscope (that is, to damage to structure), but to that curious condition called hysteria in which bodily weakness and paralysis of the limbs is caused by mental trouble. Only when the mental trouble is dealt with can the "paralysis" be cured. It is usually an easy matter for an expert to decide whether paralysis of an arm or a leg is due to hysteria or to real damage to the nervous system.

A form of paralysis which is rarely seen nowadays is the so-called "Saturday night" paralysis. When spirit drinking was more common it was not unusual for a man to drink heavily on Saturday night and to wake up on Sunday morning with one arm completely paralysed. This was due to the fact that he had gone to sleep with this arm in such a position that one of the nerves of the arm had been heavily pressed upon all night, and sufficient damage had therefore been caused to prevent the nerve from acting normally. The condition usually recovered in a week or so, unless sufficient alcohol had been taken to cause a true neuritis. (*See also* DISSEMINATED SCLEROSIS; ENCEPHALITIS LETHARGICA; HYSTERIA; LOCOMOTOR ATAXIA; NEURITIS; ST. VITUS'S DANCE.)

PARAMETRITIS.—Inflammation and swelling of the tissues in the area of the uterus is known as parametritis or pelvic cellulitis. The swelling may spread along the tissues to the abdomen or kidneys, and abscesses may form in these regions. Infection is usually caused by a tear in the neck of the womb during childbirth. The patient usually feels feverish and there may be some pain in the womb. A medical examination is necessary and the treatment consists of rest in bed and internal douching. (*See also* LABOUR; PUERPERIUM.)

PARANOIA.—Paranoia is the term applied to a mental disorder in which there are delusions, usually of persecution. (*See also* DELUSIONS; INSANITY; MENTAL DISEASE.)

PARAPLEGIA.—Paralysis of the lower half of the body or of the lower limbs is termed paraplegia. (*See also* PARALYSIS.)

PARASITE.—An animal or vegetable which lives upon or within another creature is known as a parasite. The creature that harbours the parasite is termed the "host." The vegetable parasites include bacteria and various fungi. The lowest of the animal parasites is the amœba, of which several varieties exist. These tiny creatures are responsible for the condition known as dysentery, and one type of amœba is associated with pyorrhœa. There are many varieties of worms which are parasitic on human beings and animals, causing a great deal of damage and disease. (*See also* BED BUG; FILARIA; GUINEA WORM; HEAD LOUSE; ITCH; JIGGER; LIVER FLUKE; WORM.)

PARATHYROID.—Two pairs of small glands which lie to the side of and behind the thyroid gland in the neck are known as the parathyroids. When these glands become affected in any way the nervous system appears to suffer. The nervous disorder known as tetany is a very common result, especially in children. (*See also* TETANY.)

PARATYPHOID.—A type of fever which closely resembles typhoid fever, though milder. (*See also* TYPHOID.)

PAREGORIC.—A soothing tincture of camphor and opium which is much used as a cough mixture. Paregoric should never be given to children without medical advice. (*See also* CAMPHOR; OPIUM.)

PARESIS.—This term is applied to a state of slight or temporary paralysis. (*See also* PARALYSIS.)

PARIETAL.—The term parietal is used in connection with the walls of a body cavity. For example, the layer of pleura covering the wall of the chest is called the parietal layer. The term is also used in connection with the bones which form the roof of the skull.

PARKINSON'S DISEASE.—Another name for paralysis agitans. (*See also* PARALYSIS.)

PAROTID GLAND.—One of the most important glands which supply the mouth

with saliva, the parotid gland lies just in front of the ear and its duct or channel (called Stenson's duct) runs across the cheek and opens out into the mouth opposite the second last tooth on the upper row. Inflammation of this gland is known as parotitis, and epidemic parotitis is more commonly known as mumps. (*See also* MUMPS.)

PAROVARIUM.—Certain tubes situated near the ovary constitute what is called the parovarium. Tumours or growths sometimes make their appearance in this area, causing damage to the womb. (*See also* TUMOUR; WOMB.)

PAROXYSM.—This term is frequently used in connection with a spasm, convulsion or fit. It is also used to describe a sudden attack or reappearance of symptoms. For example, there may be a sudden paroxysm of coughing, neuralgia, fever, and so on.

PARRISH'S FOOD.—Parrish's food is a very popular iron tonic which is often given to delicate children or grown-ups during convalescence. It is also known as Parrish's syrup. (*See also* IRON.)

PARTURITION.—The act of giving birth to a child is known as parturition. (*See also* LABOUR.)

PASTEURIZATION.—Pasteurization is a method of sterilizing milk without actually boiling it. The milk should be heated to a temperature of 167° F. for twenty minutes; this is sufficient to destroy or render harmless the germs that cause diseases such as diphtheria, scarlet fever, enteric, summer diarrhœa and tuberculosis. A low temperature pasteurization may be carried out in which the milk is heated for at least half an hour at a temperature between 145° and 150° F. This is sufficient to greatly reduce the number of bacteria or germs and delays the souring of the milk. There are various instruments on the market known as pasteurizers for carrying out pasteurization. (*See also* MILK.)

PATELLA.—The small rounded bone projecting from the knee-joint is known as the patella or knee-cap. Swellings on the knee-cap occur in Housemaid's Knee and the condition is described under Bursitis. (*See also* KNEE.)

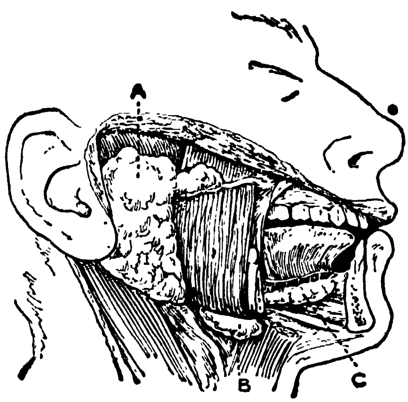
PATHOLOGY.—Pathology is the science which deals with the causes of and the changes produced in the body by disease.

PEAT BATH.—Peat baths are given in many of our spas for the treatment of rheumatism and similar disorders. Spas such as Strathpeffer obtain the peat from the surrounding moors, and many medicinal properties which make the waters famous are contained in the peat. (*See also* BATHS.)

PEDIATRICS.—The branch of medicine which deals with the diseases of children is termed pediatrics.

PEDICULOSIS.—A state of lousiness caused by pediculi or lice is known as pediculosis. (*See also* HEAD LOUSE.)

PELLAGRA.—A curious disease which occurs in tropical and sub-tropical countries, pellagra is characterized by eruptions on the



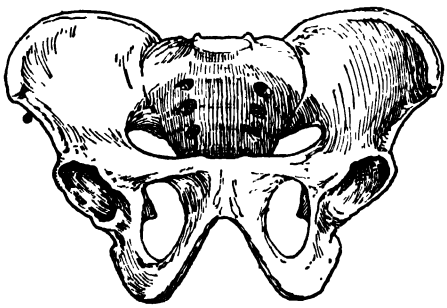
A Parotid Gland; B Submaxillary Gland; C Sublingual Gland

skin accompanied by disorders of the digestive and nervous systems. The cause of the disease is not known but it was thought to be due to the eating of diseased maize. It is now looked upon as a deficiency disease due to improper diet and lack of vitamins. The disease usually makes its appearance in people between twenty and forty years of age, and is more common in women than in men. Once the condition is established it is liable to annual reappearances of increasing severity.

Symptoms.—The patient is usually attacked in the spring with headache, weakness and depression. There is a peculiar sunburnt appearance of the skin, especially the exposed areas, which becomes red and itching. The patient may also complain of numbness or cramps in the legs, and of giddiness and insomnia. The mouth becomes sore and ulcers may form on the

tongue which becomes red and glazed. The rash lasts for about a fortnight, then gradually disappears; but it makes its appearance the following spring or later, and always in a more aggravated form. The nervous symptoms gradually become more noticeable, and emotional and mental symptoms begin to show themselves. The lunatic asylums hold quite a few pellagric patients. The digestion becomes disordered and there may be constipation or diarrhœa.

Treatment.—The treatment consists of giving a generous diet containing lean meat, fruit, vegetables, eggs and milk, etc. The skin should be protected from the sun. The administration of arsenic seems to have



Pelvis

done some good in many cases. (*See also* ERYTHEMA.)

PELVIS.—The pelvis is the space contained within the haunch bones which join together in front, with the bone known as the sacrum behind. It contains the lower part of the large intestine, that is, the pelvic colon and rectum, and also the urinary bladder, and in the female, the womb and ovaries. Close to the brim of the pelvis are the great blood-vessels which run from the abdomen to the lower limbs. Deformity of the bones of the pelvis, caused by rickets or other disorders may interfere greatly with childbirth.

PEMPHIGUS.—A disease of the skin in which blisters or large blebs appear. When the blisters subside they leave coloured patches on the skin. (*See also* DERMATITIS; SKIN.)

PENIS.—The penis is the male organ of generation. It is through the urethra, or tube of the penis, that the contents of the urinary bladder as well as those of the seminal vesicles escape. (*See also* SEX HYGIENE.)

PENNYROYAL.—An aromatic oil which is very commonly used as a remedy for flatulence and colic. Pennyroyal should never be given in large doses to women as it is very upsetting and even dangerous in certain conditions. The oil is often rubbed on the skin to ward off midges and gnats, and it may also be of some use for relieving the itching caused by these insects.

PEPPER.—Black pepper is the dried unripe fruit of an Eastern shrub, and white pepper, which is not so strong, is made from the inside part of the fruit. Pepper is used as a condiment, and acts as a stimulant to the digestion, but an excess of pepper is very apt to bring on hiccough. (*See also* CAPSICUM.)

PEPPERMINT.—The oil of peppermint is distilled from the fresh flowering tops of a plant known as the Mentha Piperita. It has an aromatic, pleasant smell, due to the presence of menthol. Peppermint is a useful remedy for flatulence and colic, especially in children. For this purpose, a teaspoonful may be given, or the oil can be given on a lump of sugar. (*See also* MENTHOL.)

PEPSIN.—This term is applied to one of the ferments found in the juices produced by the stomach. Pepsin is capable of converting protein articles of food into simpler peptone bodies so as to aid digestion. Pepsin is sometimes given along with other prepared ferments in cases where the digestive powers have become enfeebled owing to old age or illness. (*See also* DIGESTION; FERMENT.)

PEPTONE.—Peptone is a substance formed by the action of ferments during the process of the digestion of food. Beef or milk, etc., can be freshly peptonized and given to those who lack the gastric juices which enable them to digest their own food. (*See also* DIGESTION; FERMENT.)

PEPTONIZED FOOD.—A peptonized food is one which has been artificially digested or predigested by means of various ferments before it is taken into the body. Peptonized milk is very often used for children who find it difficult to digest ordinary milk. Adults who suffer from gastric troubles find peptonized foods of great benefit to them, and there are many brands of peptonized meat on the market which are available for the use of invalids. Peptonizing powders or tablets may be had from any chemist that enable milk or meat to be prepared easily in the patient's home. (*See also* PEPTONE.)

PERCHLORIDE OF MERCURY.—Perchloride of mercury is commonly referred to as corrosive sublimate. It is a powerful antiseptic, but it is an extremely dangerous poison and it is capable of tarnishing and destroying metals and materials. For cases of poisoning by this substance, the white of an egg is the best treatment until medical help is obtained. (*See also* CORROSIVE SUBLIMATE; MERCURY.)

PERCUSSION.—When a doctor wishes to find out what is wrong with a patient, it helps him a great deal if he can find out the state of the internal organs. The method the doctor uses is to strike upon various parts of the body and he can tell by the sound or note given out whether the organs are normal or diseased. This method of diagnosis is known as percussion and the doctor may use his fingers or an instrument known as a plessor. When a stethoscope is used in conjunction with percussion the term auscultation is applied. (*See also* AUSCULTATION.)

PERFORATION.—A hole made through the wall of an organ is known as a perforation, but the term is usually used in connection with the stomach or intestines. Any ulceration of the stomach or bowels may lead to perforation, and in such a case the contents of the affected organ are allowed to escape into the abdomen and a very serious state of affairs is set up. Perforation of the appendix may happen very suddenly without much previous warning, but as a rule there are bouts of pain accompanied by vomiting and an operation at the earliest possible moment is the safest line of treatment. Perforation of the ear drum may be caused by pus forcing its way through the lining of the middle ear, or an operation (paracentesis) may have to be performed in order to perforate the drum to allow the pus to escape. The perforation usually heals up quite satisfactorily and the hearing is very seldom affected. (*See also* APPENDICITIS; DUODENAL ULCER; EAR; GASTRIC ULCER.)

PERICARDITIS.—Inflammation of the pericardium, the bag in which the heart lies, is called pericarditis. This bag, or sac, is lubricated inside so that the heart, while it is beating, can move up and down with ease. As soon as the pericardium becomes inflamed, the two surfaces become roughened and scratch against each other, producing a "rubbing" sound. This friction, however, soon produces an outflow of fluid and a condition is set up known as pericardial effusion. There are many types of pericarditis and the symptoms vary in accordance with the cause of the condition.

Symptoms.—There is usually a great deal of pain and breathlessness and the patient is pale and often feverish. He is restless and complains of sleeplessness and finds great difficulty in lying flat on his back. There may be swelling on the left side of the chest, and the rubbing noise which is so easily heard in dry pericarditis becomes dull and disappears when the bag becomes filled with fluid. In some cases this fluid turns into pus and the condition is then known as purulent pericarditis. The condition is a serious one and requires the early attention of a doctor.

Treatment.—Special treatment consists of having the excess fluid drawn off if it interferes in any way with the action of the heart. Blisters and ointments are applied over the heart to reduce the inflammation. The patient must be kept in bed for three months after the temperature has returned to normal, and no games played for at least two years. Exercise should be limited to gentle walking. (*See also* HEART.)

PERICARDIUM.—The pericardium is the membrane or bag that surrounds the heart. (*See also* HEART; PERICARDITIS.)

PERICOLITIS.—Inflammation of the tissues around the colon or large intestine is called pericolitis. (*See also* COLON.)

PERIMETRITIS.—Inflammation of the membrane that lines the pelvis or womb is known as perimetritis or pelvic peritonitis. It is a very serious and painful condition and there is great danger of the inflammation spreading upwards into the abdominal cavity. In mild cases suitable spa treatment may be of great benefit, but operative treatment is the only cure for cases that have been allowed to go too far. (*See also* PERITONITIS.)

PERINEUM.—The area situated between the opening of the bowel behind and the genital organs in front is termed the perineum. During labour it is quite common for this area to become torn owing to the progress and force of the child, and the defect, if not properly repaired at the time of the birth, may lead to prolapse of the womb and other disorders. (*See also* WOMB.)

PERIOD.—This is a popular term for the menstruation period. (*See also* MENSTRUATION.)

PERIOSTEUM.—The membrane covering the surfaces of bones is known as the periosteum. This membrane is well supplied with blood-vessels and nerves which help in the nutrition and development of the bones. Disease of the periosteum may lead to necrosis or death of the underlying bone. (*See also* BONE; NECROSIS.)

PERIOSTITIS.—Inflammation on the surface of a bone which affects the periosteum is known as periostitis. This condition varies a great deal; some cases may be very trifling indeed while others may affect a whole limb. Any knock or injury to a limb may bring about this condition and cause swelling and tenderness. The severer forms of periostitis are due to germs which are found in the pus in the bone, the milder forms are generally caused by the irritation set up by the injury.

Treatment.—The mild cases require only rest and hot fomentations or other soothing applications. Severe cases require immediate operation so that the pus can be removed from the bone otherwise the inflammation may spread and cause the whole limb to be affected. (*See also* BONE; NECROSIS; OSTEITIS.)

PERIPHERAL NEURITIS.—A form of neuritis which affects the limbs and other parts of the body. It is more often called multiple neuritis, and is caused by poisoning of the system, either by disease or alcohol or some such substance. (*See also* NEURITIS.)

PERISTALSIS.—The peculiar wave-like movement by which the contents of the stomach and bowels are moved forward is known as peristalsis. This movement is caused by a series of contractions of the muscles. Normally, one is unaware of these contractions going on, but when any obstruction takes place, they may become so increased as to be noticeable through the abdominal wall. Obstruction in the intestines is liable to cause a severe form of pain known as colic. (*See also* COLIC.)

PERITONEUM.—The membrane which lines the abdominal cavity is known as the peritoneum. It also forms a covering for most of the organs contained within the abdominal cavity and as it passes from one organ to another the peritoneum forms numerous folds. (*See also* ABDOMEN; MESENTERY; OMENTUM.)

PERITONITIS.—Peritonitis means inflammation of the peritoneum or membrane lining the abdominal cavity and organs. Inflammation of this membrane varies a great deal in its severity and, as can be readily understood, it can be caused by a variety of conditions. The inflammation may be localized in one spot or it may spread over a large area and involve many of the abdominal organs. The inflammation is very often started as a result of a gastric ulcer, typhoid fever, gall-stones, or any condition which leads to perforation of the stomach, bowels, bile-ducts or bladder. Abscesses or cysts may burst and so start up inflammation, and appendicitis is a very common cause of peritonitis.

Symptoms.—The symptoms usually begin with severe pain in the abdomen accompanied by vomiting. The temperature may rise as high as 104° or 105° F. There may be a certain amount of diarrhœa at first, but the bowels soon become constipated. The patient is found to lie on his back with the knees drawn up and the breathing is very shallow. The abdomen becomes distended and is very tender to the lightest touch. The tongue becomes furred and dry and the facial expression is drawn and anxious. The outlook is very serious, especially in the puerperal form which sometimes comes on a few days after childbirth. Acute tuberculous peritonitis may follow tuberculosis of the abdominal glands, the intestines, or the genital organs.

Treatment.—Immediately the diagnosis is made the question of operation must be considered. In cases due to perforation, operation is usually carried out immediately, because it is necessary to remove any septic material from the abdomen as soon as possible. Peritonitis due to tuberculosis is usually treated medically and not surgically. The patient should be kept in bed, preferably in the open air, and the diet should be good and nourishing. (*See also* PERITONEUM.)

PERITYPHLITIS.—Inflammation of the tissue surrounding the appendix is known as perityphlitis. (*See also* APPENDICITIS.)

PERNICIOUS ANÆMIA is a serious disease of the blood most commonly affecting men in middle life and usually manifesting itself in a gradually increasing

weakness and a yellow colour of the skin. The diagnosis can only be made precisely by a microscopic examination of the blood, and this should always be carried out by the doctor (or a consulting physician) at an early stage of the disease, both to differentiate it from other serious diseases which may resemble it and to get treatment begun as soon as possible. For, while a few years ago everyone who contracted pernicious anæmia died of it in a comparatively short time, nowadays it is easily controlled (and sometimes completely cured) by a special diet and treatment instituted by Drs. Minot and Murphy of Boston, U.S.A.

Pernicious anæmia is different from the ordinary anæmia that responds to treatment with iron and also from the anæmia due to loss of blood in which blood transfusion can immediately effect a transformation. Such methods of treatment were formerly tried in pernicious anæmia, but were of no avail. Pernicious anæmia is due to a breaking-down of the supply of red blood corpuscles, caused by some deficiency in the substances that stimulate the formation of red blood corpuscles in the body. This essential substance is suspected to be something in the stomach juices and therefore depends on a healthy digestive system; but the whole subject of the cause of pernicious anæmia is still obscure. What is no longer obscure is the highly successful treatment of the disease. Dr. Minot had been treating his patients who had anæmia, pernicious or otherwise, by different kinds of diet, and among other diets he tried he used to suggest eating some liver each day. Some patients seemed to be better when taking liver and Dr. Murphy, who worked in the same hospital at Boston as Dr. Minot, improved on this by increasing and increasing the amount of liver in the diet of patients with pernicious anæmia, with better results than anyone had ever had before. Eventually Drs. Minot and Murphy, working together, were able to demonstrate the control and practically the cure of this inevitably fatal disease by making their patients eat from a half to one pound of liver each day. The only trouble about this was that such an amount of liver daily soon became unbearably unpalatable, but extracts of liver were introduced and found to be equally effective. Also, because of the unpalatability of liver and on the assumption that pernicious anæmia was due to some gastro-intestinal deficiency, the effect of eating hog's stomach was tried and also found effective, and extracts of the stomach were also used successfully.

Treatment.—To-day pernicious anæmia is usually treated by giving the patients liver extract made up in various palatable forms, or it may be given by injection; the only thing against this is the expense, and because they are comparatively expensive patients are apt to take less than the dose they ought to take. Hog's stomach and stomach extract are cheaper than liver and liver extract, and as they are just as effective as liver, patients would do well to take them instead of it. Fresh liver in effective amounts costs about 8d. to 1s. 10d. per day, while fresh stomach in an equal dose costs only about ½d. to 1d. Some stomach extracts are dear; but quite potent ones, such as Pepsac, are cheap and cost less than 2d. a day in an effective daily dosage, once the patient has got his blood back to approximately normal; during the period of treatment while this is being done about four times the amount is necessary. It is important to look at the point of view of expense in the treatment of this disease, because the treatment—whether by liver or stomach—usually has to be kept up for life. It is hoped that in time intramuscular extracts will be available that will bring the cost down even lower.

PEROXIDE OF HYDROGEN.—A solution of oxygen in water, commonly used as an antiseptic. (*See also* HYDROGEN PEROXIDE.)

PERSONALITY is the sum total of an individual's response to life. It is quite distinct from character, which is to a large extent dependent upon a person's training and teaching. Personality is more than that: it is the result of the influence of surroundings plus the inborn characteristics which make one person absolutely distinct from another. Types of personality very often run in families so that if one form of mental trouble attacks one member of a family and another member of the same family also develops a disorder of the mind, it is almost certain that both will suffer from the same type of mental upset, since their type of personality is similar.

There are in general two types of mental

personality: one is the "hail fellow well met" type, who is sociable, friendly, much affected by his surroundings and very adaptable to them; the other is the quiet, retiring, rather shy individual, who is hard to understand and who shows his feelings only in a sympathetic atmosphere, being very hard to "draw out." From these two types of personality, those who study disorders of the mind have discovered that the first type, the genial, adaptable type, is more likely, if he does develop a mental illness, to suffer from mania, or the manic-depressive form of insanity (q.v.), whilst the shy retiring individual who becomes mentally sick merely retires further into himself and develops dementia præcox (q.v.). It is possible to distinguish types of personality from a bodily aspect, as well as from a mental one. The *asthenic* personality is thin, tall, almost "lean and hungry looking" and is usually intellectual. The *pyknic* type, on the contrary, is short, fat, thick-necked and is the typical "business man." The bodily health has, however, much to do with altering the personality, both from a mental and bodily aspect. (*See also* HABIT; MIND.)

PERSPIRATION.—Moisture which is given off from the skin is known as perspiration or sweat. (*See also* SWEAT.)

PERTUSSIS.—Pertussis is another name for whooping-cough. (*See also* WHOOPING-COUGH.)

PERUVIAN BARK.—Quinine is obtained from Peruvian bark, or cinchona bark as it is also called. (*See also* QUININE.)

PESSARIES.—An instrument for supporting the womb when it is displaced is called a pessary. The term is also used for medicated suppositories which are introduced into the vagina.

PETECHIA.—A small round spot caused by bleeding into the skin is called a petechia. (*See also* PURPURA.)

PETIT MAL.—This term is used in connection with a very mild epileptic fit. (*See also* EPILEPSY.)

PETROLATUM.—Petrolatum is another name for vaseline. (*See also* PARAFFIN.)

PHAGEDÆNA.—A sore or ulceration which spreads very rapidly and is so severe in character that pieces of tissue become dead and gangrenous and slough off. This type of sore was, at one time, very common in prisons, hospitals and camps in the days before antiseptics were used, but it is now seen only in tropical countries. The condition is also known as Aden ulcer, Guiana ulcer, tropical ulcer, Cochin sore and various other names, according to the place in which it is found, but it is common in hot, damp climates, and sometimes occurs in epidemic form. It commences as a small red blister which increases in size and finally bursts, leaving an ulcer which gives off an offensive odour. The ulcer is usually situated on the top of the foot or on the front of the leg, and rarely occurs on parts of the body covered by clothing. The treatment is drastic and must be thorough. The ulcer should be cauterized under a general anæsthetic, or pure carbolic acid should be applied to dispose of the gangrenous parts. Whenever any further signs of gangrene appear, carbolic acid should be promptly applied. (*See also* BALANITIS: GANGRENE.)

PHAGOCYTE.—A cell which is able to destroy germs and other harmful particles in the blood is termed a phagocyte. (*See also* LEUCOCYTE.)

PHALANGES.—The bones in the fingers and toes are known as the phalanges. There are three of these, in each finger and toe, the proximal, the middle and the distal; but the thumb and the big toe have each only two.

PHARMACOLOGY.—The part of medical science dealing with the knowledge of the action of drugs about the body. It used to be known as materia medica.

PHARMACOPŒIA.—The official publication dealing with the recognized drugs and their doses is known as the pharmacopœia. Most countries have a pharmacopœia of their own. (*See also* the initials B.P., which stand for BRITISH PHARMACOPŒIA.)

PHARMACY.—Pharmacy is the term applied to the preparing of drugs and medicines. Chemist shops are also known as pharmacy shops.

PHARYNGITIS.—This condition is an inflammation of the part of the throat immediately beyond the mouth. The inflammation may be acute or chronic and it is usually due to septic tonsils or to some affection of the nose. A simple iodine paint such as Mandl's paint is usually sufficient to clear up the matter. (*See also* LARYNGITIS; TONSILLITIS.)

PHARYNX.—The pharynx can be seen at the very back of the mouth when it is

wide open. The term throat is popularly applied to this part, but strictly speaking the pharynx is the cavity into which the nose opens above and from which the larynx and gullet open below. The part which lies behind the nose is called the naso-pharynx. (*See also* PHARYNGITIS.)

PHENACETIN.—This drug is commonly used to give relief in headaches and neuralgia as it is particularly good for deadening pain, but it should not be taken in quantity as it has a very depressing effect.

PHENOL.—Phenol is a derivative of benzene and it is more commonly known as carbolic acid. (*See also* CARBOLIC ACID.)

PHIMOSIS.—A condition in which the foreskin cannot be drawn back to uncover the penis is called phimosis. In many cases the opening may be so small as to prevent the passage of urine, and this, along with the accumulation of secretion, causes great irritation. The only satisfactory treatment is by circumcision, which consists in removing a part of the foreskin so that it can be easily drawn back. The operation should be carried out as early as possible, because in very young children it is a slight affair, while the longer it is postponed the more troublesome it becomes. (*See also* BALANITIS; PENIS.)

PHLEBITIS.—Inflammation of the veins, usually accompanied by clotting of the blood in the veins, is known as phlebitis. It may occur after childbirth, typhoid fever, or a surgical operation and is frequently a complication of varicose veins. The affected limb is tender and subject to aching and shooting pains. The part surrounding the vein becomes swollen and there may be bad cramps in the limb. It is treated by rest and soothing applications, such as belladonna in glycerine. Phlebitis is chiefly dangerous because of the risk of a clot becoming detached and travelling to some vital organ such as the heart, when it may cause sudden death. The patient, therefore, must be kept in bed until all signs of inflammation have disappeared, and the diet should be very light. It may be necessary to wear an elastic bandage for support if the limb is inclined to swell. A very useful drug in cases of phlebitis is extract of horse chestnut, a French preparation, which usually eases the pain and even seems to have a curative action sometimes. (*See also* THROMBOSIS.)

PHLEGM.—The material which is brought up after coughing is popularly called phlegm. It is also medically known as sputum or expectoration. (*See also* EXPECTORATION.)

PHLEGMASIA.—This term applies to a condition which may occur during the lying-in period of childbirth in which the leg or legs become swollen, due to phlebitis, or inflammation of the veins. The condition is medically known as phlegmasia alba dolens but is more commonly called white leg. (*See also* PHLEBITIS; WHITE LEG.)

PHOBIAS are obsessions (q.v.) of fear. They are very persistent and may become so chronic that they overwhelm the mentality of the individual and leave him just a vegetable with one fixed idea, the fear of something. These phobias may take many shapes. The most common ones are fear of places, such as fear of being shut in a room, or in the Underground railway; fear of heights or of rivers. Fear of certain animals is very common also, such as fear of rats and mice, or of cats. Fear of certain diseases may produce real nervous or mental breakdowns in those unfortunate enough to be afflicted with such phobias. The case of the doctor who committed suicide because he was afraid he had cancer is a typical example of what such a phobia may lead to. Fear of cancer, and fear of tuberculosis or syphilis, are perhaps the most usual phobias of disease. Treatment of these fears depends on the power of the medical adviser to secure the trust of the patient, and in some cases on psycho-analysis. (*See also* CLAUSTROPHOBIA; OBSESSION.)

PHOSGENE.—Phosgene, also known as carbonyl chloride, was one of the chief poison gases used during the Great War. It is a colourless, odourless gas, heavier than air, and anyone coming in contact with it experiences some watering of the eyes and a severe choking sensation. Coughing and vomiting are followed after a short time by inflammation of the lungs. Broncho-pneumonia is a very common result of phosgene poisoning, if death has not already occurred.

Treatment consists of placing the poisoned person in a suitable position so that he can drain the lungs and get rid of the sputum, and oxygen should be given. Bleeding the patient may help to make things easier for him by lessening the circulation of the poison.

PHOSPHORIC ACID.—Dilute phosphoric acid forms a part of many tonics and it is especially useful in the treatment of certain types of indigestion. Phosphate of iron forms a syrupy compound which is better known as Parrish's Food and it contains phosphoric acid along with phosphates of iron and calcium. It is a very popular tonic for weakly children and convalescents. (*See also* IRON.)

PHOSPHORUS POISONING.—In cases of phosphorus poisoning an emetic should be given at once and after the stomach has been emptied, some white of egg should be administered. Small doses of sulphate of copper in water should be given at frequent intervals. Castor-oil, Epsom salts or other purgatives may be given. (*See also* POISONING in FIRST AID SUPPLEMENT at end of book.)

PHOTOPHOBIA.—A condition in which a person is afraid of letting a bright light shine upon the eyes is known as photophobia. It is one of the symptoms of inflammation of the eye. (*See also* CONJUNCTIVITIS; EYE.)

PHRENOLOGY.—A theory exists that certain qualities and faculties of the mind occupy certain parts of the brain and some people make out that by "reading the bumps" on the skull they can tell whether these qualities and faculties are present. The theory has no scientific basis.

PHTHISIS.—Any disease in which there is much wasting away of the body, especially such as in tuberculosis, is known as phthisis. (*See also* TUBERCULOSIS.)

PHYSICIAN.—A physician is a doctor who treats diseases by drugs and other methods than that of surgery.

PHYSIOLOGY.—The branch of medicine in which the normal workings of the body are studied is known as physiology.

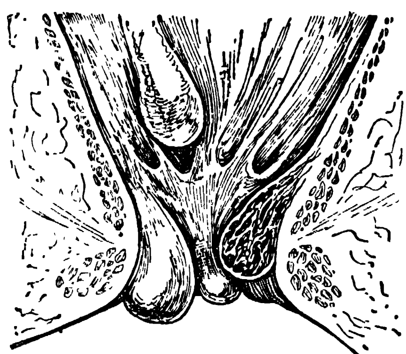
PHYSOSTIGMINE.—This drug is obtained from the calabar bean and it is mostly used in eye work. (*See also* CALABAR BEAN; LAMELLA.)

PIA MATER.—This name is given to one of the three membranes surrounding the brain and spinal cord. (*See also* BRAIN.)

PICRIC ACID.—A yellow, crystalline substance which is used in medicine because of its antiseptic properties. It forms an intensely yellow solution which stains the skin or any material it comes in contact with. It belongs to the same group as carbolic acid and is also known by the name of trinitrophenol. It is never given internally as it is very irritant, and many people find it causes irritation to the skin when applied as a dressing. It has been found of value in the treatment of erysipelas, eczema, chilblains and burns.

PIGEON BREAST.—A deformity of the breast in which the breast-bone sticks out in front giving a pointed appearance to the chest. It is usually due to rickets, but may also be caused by frequent attacks of bronchitis. (*See also* RICKETS.)

PIGMENTATION.—Pigment is the term applied to the colouring matter of various substances in the body, particularly in the blood. The absence of this colouring matter leads to albinism. In various diseases there



Hæmorrhoids or Piles

is an increase of pigmentation and in jaundice the discoloration that takes place in the skin is due to the bile pigment in the blood. (*See also* ALBINO; JAUNDICE.)

PILES.—Medically known as hæmorrhoids, piles is a varicose condition of the veins of the lower part of the rectum. The expression "an attack of piles" means an attack of inflammation in these veins. Any sign of bleeding when the bowels move should lead one to suspect the presence of piles and medical advice should be sought on the matter, especially in an elderly person.

Piles may be external or internal. External piles appear as tags of skin outside the opening of the rectum and do not cause much irritation unless they become chafed or infected, when they cause great pain and discomfort for several days. Internal piles have no very marked symptoms until they begin to bleed, but they may protrude from the opening and if not pushed back, they may become bruised and acutely painful.

Chronic constipation, sitting about too much, lack of exercise, alcoholic excess and pregnancy are the most usual causes of piles. To cure them, the constipation must be treated by diet and drugs if necessary. The parts around the opening should be kept scrupulously clean, using cottonwool instead of the ordinary paper, and a soothing ointment containing gall may be applied at intervals. If the piles do not disappear with improved habits and hygiene, they should be injected by a doctor. Operation is only advised in the more severe cases. (*See also* FISSURE.)

PILL.—Pills are round masses containing drugs held together by syrup, gum, or some other adhesive extract. They are usually coated with sugar or gelatine, but pills that are intended to act upon the bowels only are coated with keratin or glutol, substances which do not dissolve in the gastric juice of the stomach. If any difficulty is experienced in swallowing a pill, it should be taken with a mouthful of water or rolled inside a piece of bread. The majority of pills contain drugs which act upon the bowels, and one or two may be taken according to the strength of the drug in them. (*See also* PURGATIVES.)

PILOCARPINE.—Also known as jaborandi, pilocarpine is a drug which is given to induce sweating. (*See also* JABORANDI.)

PIMPLES.—Small raised and inflamed spots on the skin are called pimples or papules. (*See also* ACNE; DERMATITIS.)

PINE.—Oil obtained from the fresh needles of pine trees is mainly used as an inhalation for catarrh. It acts as an antiseptic and has much the same action as turpentine. Tar ointments are made from oil of pine, and they are of great value in the treatment of skin diseases. (*See also* TAR.)

PINEAL BODY.—A small structure situated on the upper part of the brain is known as the pineal body. It does not seem to have any known function, though tumours of this area tend to produce sexual precocity, paralysis of the eyeball, and other symptoms. (*See also* BRAIN.)

PINK EYE.—This popular term is often used to describe the condition known as infective conjunctivitis (inflammation of the eye). The eyeball is very red and irritable, and a doctor should be called; the eye may be bathed with weak bicarbonate of soda solution. (*See also* CONJUNCTIVITIS.)

PINS AND NEEDLES.—The sensation popularly referred to as pins and needles may occur after a limb has been "asleep." It is a form of paræsthesia, this being the term applied to any kind of sensation produced in the skin apart from those which can be normally accounted for. This prickling sensation is very often a symptom of diseases of the spinal cord, epilepsy, neuralgia, or hysteria. (*See also* PARÆSTHESIA.)

PITTING.—When pressure on the skin leaves a depression which takes some time to disappear, the condition is called pitting. It occurs in the disease known as dropsy, where the tissues are swollen with fluid. (*See also* DROPSY.)

PITUITARY BODY.—The pituitary body is a small structure situated at the base of the brain and it forms one of the important ductless glands of the body. (*See also* BRAIN; DUCTLESS GLANDS.)

PITUITARY GLAND.—Attached by a stalk to the underside of the brain, but well protected from possible injury by a bony case of its own, lies a very wonderful part of the nervous system, the pituitary gland, or more shortly called the pituitary. This organ, which is only partly composed of nervous tissue, the other part having developed from the same tissue as the inside of the mouth, controls not only our height, our weight and our width, but also our mental powers and physical energy.

The front part of the pituitary is mainly concerned with controlling growth. It is a gland-like structure and in it is formed some mysterious chemical substance called pituitrin, the composition of which has not yet been discovered. This substance is poured into the blood and upon the amount and the correct composition of it depends our rate of growth. If *too much* is formed in early life, every part of the body, but especially the bones, grows at too fast a rate, so that people so affected become giants. It is probable that all the famous giants in history were victims of disease of the pituitary, because examination of many of their skeletons has revealed that the bony case which housed the pituitary during life was enlarged and that therefore the pituitary must also have been enlarged and diseased. When the front part of the pituitary forms too much of this unknown chemical substance after a person has

reached adult life, the whole of the bony skeleton increases in size, but particularly the hands and feet, so that the unfortunate victim takes larger and larger sizes in gloves and boots or shoes. The head also tends to increase in size, so that a larger size in hats is necessary. All the features of the face become rather coarse: the lips become thick and the tongue seems too large for the mouth. Because in a large number of cases of this condition, there is a tumour of the pituitary which is growing steadily, a gradually increasing headache is complained of. Very often, too, it is noticed that whilst objects straight in front can be seen perfectly, the head has to be turned to see things at the side which could normally be seen without difficulty when looking straight ahead. This is because the tumour has begun to press on the nerves at the back of the eyes. It is the work of the expert in nervous diseases to determine whether, and when, such a tumour should be operated on. The results of removing the pituitary with its tumour in such a case are good in the right surgeon's hands, and the operation not only saves the eyesight and relieves the headache, but by removing the primary cause of the overgrowth of the bones, it cures the unsightly condition.

Too little of this mysterious chemical substance formed in the front part of the pituitary gland produces different effects according as to whether the patient is a child or an adult. In a child, one of two things may happen: growth in every sense may be stopped; the child remains a child, but grows enormously fat and the reproductive organs do not develop beyond the childish stage. The mind, too, remains that of a rather stupid child. This picture is that of one type of dwarf. The other type is quite different: the child becomes a "man in miniature." The body is small, but not the round fat body of a child, the body having undergone the normal changes from an infant to that of an adult. The sexual organs are well-developed and the intelligence is often above normal. In these two types, tumour formation in the pituitary is rare, the cause of the lack of chemical substance being some under-development of the gland. In the adult, lack of this substance gives rise to a curious condition (adiposa dolorosa), in which masses of fat which are painful and tender to the touch, accumulate in certain parts of the body, particularly on the upper arms and on the thighs. The condition is more common in women than in men and is peculiar in that changes in the character occur. Such patients not only become miserable and depressed, but they weep without cause; and on being asked why they weep, reply that they do not know, but cannot help it. They are wrapped up in their own misery. Much can be done for them by giving them pituitary gland preparations, but the mental state does not show the same improvement as the physical condition.

The action of the back part of the pituitary is a very complicated one. Too much or too little of the chemical substances formed by this part of the gland does not give rise to such obvious diseases as those seen when the front part of the gland is affected, but we know that certain substances are formed in the back part of the pituitary, which have a great influence on our lives. One definite substance called "pituitrin" has been prepared in a pure state from the back part of the pituitary, and this has a real value in saving life. This substance causes certain types of muscle to contract strongly, and so by making the muscle in the walls of blood-vessels contract, an injection of pituitrin has saved many people from dying from surgical shock. Also, it has saved many mothers from dying from hæmorrhage after the birth of their children, and has shortened the time of their labour by making the womb contract more strongly. Other substances formed in this amazing little structure, which is only the size of a small cherry, control the use and storage of sugar in the body and the output of water. (*See also* Ductless Glands.)

PITYRIASIS.—Various types of skin diseases of which scaliness is the chief feature are described as pityriasis. (*See also* Dandruff; Dermatitis; Lichen; Psoriasis.)

PLACENTA.—The placenta is a structure planted on the wall of the pregnant womb which connects the blood supply of the mother with the circulation of the developing baby (or fœtus) by means of the umbilical cord containing important blood-vessels. When the baby is born the placenta comes away a few minutes afterwards and

is so called the "after-birth." (*See also* AFTER-BIRTH.)

PLAGUE.—Bubonic plague, which was known in the Middle Ages as the Black Death, is the most usual form of plague and it is discussed under its own heading. The *pneumonic* type is distinct from bubonic plague in that it affects the lungs, and it is the most fatal form of the disease. The symptoms resemble those of a severe attack of pneumonia and there is extreme weakness, heart failure, delirium, and unconsciousness, and death very often occurs between the second and fourth days. *Intestinal plague* is a form in which purging and vomiting are the prominent symptoms. Another type of plague is known as *septicæmic* plague in which the germs enter the blood and the patient may die on the second or third day, or sometimes within a few hours. (*See also* BUBONIC PLAGUE.)

PLASTER.—Plasters are solid preparations which are usually spread on some fabric and applied to the skin. The type of plaster used depends on the condition which is under treatment, as some plasters contain drugs that are soothing while others promote reddening of the skin. Large plasters that are intended to stay on for any length of time are usually spread on strong linen, and numerous holes are made for the evaporation of sweat. This is called a porous plaster. Plasters that have no holes must be changed every day, if not oftener, especially if the wound is in an unclean condition. Belladonna plaster is used for soothing pain such as in rheumatism and neuralgia, and a mustard plaster is very popular in the treatment of lumbago, etc. A plaster containing cantharides is used when the skin requires blistering. A plaster made of antiphlogistine laid directly on the skin is excellent in the treatment of boils. (*See also* ADHESIVE PLASTER; COURT PLASTER.)

PLASTER OF PARIS.—Dried calcium sulphate is used to make plaster of Paris splints. One pint of water is used to two pounds of plaster and this sets rapidly and firmly. Bandages impregnated with the powder are called plaster of Paris bandages, and are used when the limbs must be kept in position, such as in fracture, etc.

PLETHORA.—An excess of blood which causes a fullness of the blood-vessels is described as plethora. This condition is quite common in those who over-eat and over-drink, and a "plethoric" person is usually red in the face and is liable to gout and apoplexy and such like conditions. The condition is due to an excess of the red blood cells; it may be due to over-development of the thyroid gland.

PLEURA is the membrane that covers the lungs and also lines the cavity—in which the lungs lie—called the pleural cavity. The pleura secretes a serous fluid which allows the expanding or contracting lung to slide up and down in the pleural cavity, which is almost non-existent, as the lung lies close against its wall. (*See also* LUNG.)

PLEURISY is inflammation of the pleura, or covering membrane of the lung. Usually only one lung is affected, and often only part of its surface. It is generally caused by exposure to cold and wet; but it may be a manifestation of tuberculosis or a complication of various diseases, such as pneumonia, or even Bright's disease (of the kidney). There are two main types of pleurisy, dry and wet.

In **dry pleurisy** there is a sticky exudate in the pleural membrane and the two surfaces stick together, causing severe pain on breathing. The temperature is usually a little raised, 99° F. or 100° F., the breathing is shallow (to avoid expanding the lung over-much), the pulse quickened and the patient complains chiefly of a severe "stitch in his side," worse on breathing. The only conditions that may be confused with dry pleurisy are intercostal neuralgia (neuralgia of the nerves that run between the ribs), and herpes, or shingles, before the eruption appears.

Treatment.—The treatment of pleurisy includes rest in bed, fluid diet, the application of tincture of iodine or of antiphlogistine to the affected side; strapping the ribs firmly with sticking-plaster almost right round. If the iodine or antiphlogistine is not enough to relieve the pain, a sedative cough mixture and ten grains of aspirin or something similar at bedtime. After an attack of pleurisy the chest should always be X-rayed to make sure that the lung is healthy.

Wet Pleurisy or Pleurisy with effusion.—This is the second type of pleurisy, when the inflammation of the pleural membrane is

followed by an outpouring of fluid between the wall of the chest and the surface of the lung. The symptoms are much the same as in dry pleurisy, except that the patient is usually more blue—from the pressure of the fluid on the lung and heart—and does not complain so much of a stitch in his side, though he is rather inclined to be distressed on slight exertion.

Treatment.—The doctor, when he examines the chest, finds marked dullness over the affected lung, and may have to draw off the fluid with a syringe, especially when it shows signs of pressing on the heart. Sometimes tincture of iodine or antiphlogistine applied to the chest is enough to dry up the fluid, when it is present in small amount only. Convalescence must be prolonged, the chest X-rayed, and breathing exercises carried out regularly, as it is in this type of pleurisy that tuberculosis most frequently develops afterwards.

PLEURODYNIA.—Sharp pain in the nerves and muscles that lie between the ribs is called pleurodynia. It may be due to rheumatism or to neuralgia. There is usually difficulty in breathing and severe pain is felt with every breath. The pain may be relieved by the application of heat in the form of fomentations or poultices, or by means of radiant lamps. Drugs of the salicylate group such as aspirin, etc., are very useful. (*See also* FIBROSITIS; RHEUMATISM.)

PLEXUS.—A network of nerves or vessels is called a plexus. The most well-known network of nerves, etc., is the solar plexus which supplies branches to all the organs in the abdomen. (*See also* NERVOUS SYSTEM.)

PLOMBIÈRES DOUCHE.—Washing out of the lower bowel by means of a soft rubber tube through which several pints of water are slowly allowed to run is known as the Plombières douche. Various fluids, but especially normal salt solution, are used for this purpose. Such conditions as colitis, nervous dyspepsia, mild types of dysentery and such-like conditions are specially suitable for the Plombières treatment. (*See also* BATHS; DOUCHE; IRRIGATION.)

PLUMBISM.—The Latin word for lead is plumbum, so lead poisoning is often referred to as plumbism. (*See* LEAD POISONING.)

PLUMMER'S PILL.—This is another name for compound calomel pill which contains calomel, antimony, and guaiacum. (*See also* ANTIMONY; CALOMEL.)

PNEUMATOSIS.—A condition in which the stomach becomes swollen owing to the presence of gas. It is a form of nervous flatulence and may be due to air swallowing. (*See also* AEROPHAGY; FLATULENCE.)

PNEUMOCONIOSIS.—Diseases of the lungs which are brought about by the inhalation of dust are known as pneumoconiosis. (*See also* ANTHRACOSIS; OCCUPATIONAL DISEASES; SILICOSIS; TUBERCULOSIS.)

PNEUMONIA, or inflammation of the lungs, is of two types called broncho-pneumonia and lobar pneumonia.

Broncho-pneumonia, sometimes called catarrhal pneumonia, is an extension of bronchitis (inflammation of the lining of the little tubes that lead air into the lungs) into the tissue of the lung and affects little patches in the lungs here and there. It is more common in children than in adults; though it is not uncommon among old people, and usually shows itself as a bronchitis which gets worse instead of better, frequently a complication of measles or whooping-cough. It is generally rather a long-drawn-out illness and the patient usually requires rather a long period of convalescence to regain his strength.

Treatment.—The treatment is similar to that of bronchitis. Careful nursing and plenty of fresh air are the essentials, with light nourishing foods to keep up the strength. Ipecacuanha wine (enough to make the patient sick) is an old-fashioned remedy for this disease, but it is as good as ever, as it liberates the thick secretion from the affected lungs. Steam-kettles, menthol and Friar's balsam inhalations and oxygen (*not* when the patient is at the point of death, but when the complexion is bluish, showing congestion) are all useful.

Lobar Pneumonia is the variety commonly meant when the term "pneumonia" is used, and it is so called because an entire lobe or division of the lung is affected by the inflammation and may be "solid" with the thick secretion that is poured into the air vesicles of the lung. The lower lobes are those that are generally affected. Men get pneumonia more often than women, and alcoholics notoriously do badly.

Symptoms.—It is not usually difficult to tell when a person has pneumonia. Pain in

the side of the chest, shivering, a high temperature—from 101° F. up to 104° F. or more, a quick pulse, rapid breathing (sometimes difficult breathing), "rusty" sputum, and a flushed face are the easily recognized symptoms that denote pneumonia. Sometimes, however, the pain is low down and makes one think at first that the illness may be appendicitis, but it usually soon becomes clear that the chest and not the abdomen is affected. The disease is caused by a germ called the pneumococcus (which some experts say nowadays is only a variety of streptococcus) and four varieties are recognized, called Types I, II, III and IV pneumococcus; deaths are most common with the type III variety and least common with the type IV. The different types can only be recognized by an expert bacteriologist, and the examination takes about a day to complete.

Treatment.—The importance of recognizing the type is that there is a serum, called Felton's anti-pneumococcal concentrated serum (called after the American doctor who introduced it) now available which has a wonderful curative effect, but unfortunately—so far—only for types I and II. The serum has to be given within the first 72 hours of an attack and is more effective still when it is given within the first 48 hours. But the serum costs about £3 a dose, and the treatment may require up to £20 worth of serum. If a couple of doses of serum have been given and then the pneumonia is found to be due to type III or type IV pneumococcus the serum (and the money) has been wasted. But in a serious case it is always worth while to give a dose of the serum, while the bacteriological examination is being made.

In addition to serum treatment the chief treatment is careful nursing. There is no illness in which a good day and night nurse makes such a difference in the outlook. The patient's heart must be kept going for about a week; when the "crisis" comes, usually on the eighth day, the temperature falls suddenly, the pulse and the breathing become quieter, and the patient breaks out into a perspiration. Before the crisis some doctors give brandy to keep the heart going; some give champagne; some strychnine or digitalis (drugs that are heart stimulants); some oxygen all through the illness. Some doctors say that brandy is harmful in pneumonia; some give it regularly in every case. Some give their patients morphia to ensure quiet nights; others say that morphia is a poison in pneumonia. Some give expectorants to help the patients to cough up sputum; others give iodides to get the thick sputum to dissolve. "Pneumonia jackets" of cotton-wool covered with gauze back and front, to the chest, are popular with some nurses and doctors; others prefer Antiphlogistine applied to the back of the lungs, as it can be left on for 24 hours and acts like a warm poultice. But most doctors will admit that a good nurse is more important than a good doctor in a case of pneumonia.

PNEUMONIC PLAGUE.—The two main types of plague are bubonic and pneumonic; the former type is distinguished by the appearance of buboes or swellings, while in pneumonic plague the lungs are involved. (*See also* Bubonic Plague; Plague.)

PNEUMOTHORAX.—A condition in which air or gas is present in the pleural cavity is known as pneumothorax. In modern treatment of tuberculosis of the lung it is introduced artificially by a needle to collapse the lung and so rest and heal it. (*See also* Emphysema; Lung; Pleurisy.)

PODAGRA.—Podagra is another name for gout. (*See also* Gout.)

PODOPHYLLUM.—A resin obtained from the root of a plant which grows in the United States and Canada. It is a purgative which takes a long time to act, and it is so disagreeable to the taste that it is better to dissolve it in some aromatic spirits of ammonia. (*See also* Purgative.)

POISONS AND POISONING.—These headings are discussed fully in the First Aid Supplement at the end of the book. Poisonous drugs will be found under their own headings.

POLIOENCEPHALITIS.—Inflammation of the brain in which the grey matter is particularly affected is called polioencephalitis. (*See also* Brain; Encephalitis.)

POLIOMYELITIS.—Inflammation affecting the parts of the spinal cord which control the muscles responsible for the movement of the arms and legs is known as poliomyelitis. This condition is most common in children and is better known under

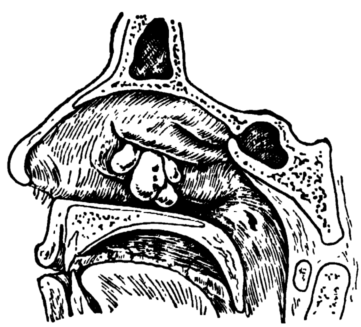
the name infantile paralysis. (*See also* INFANTILE PARALYSIS.)

POLITZER'S BAG.—An india-rubber bag fitted with a nozzle is used for inflation of the middle ears through the Eustachian tubes by blowing air up one nostril while the other is closed. This method of treatment was first described by Adam Politzer, an Austrian ear specialist, in 1863. (*See also* EUSTACHIAN TUBE.)

POLYDACTYLISM.—This term is used to describe the condition in which there are more than the normal number of fingers or toes on each hand or foot. The condition is usually present at birth and a slight operation can often restore the limb to a more or less normal appearance. (*See also* CHILDBIRTH; HEREDITY.)

POLYNEURITIS.—Polyneuritis, or multiple neuritis, is a disease due to inflammation of the nerves in various parts of the body. (*See also* NEURITIS.)

POLYPUS, NASAL.—Growths which occur on one or both sides of the nose are called polypi (plural of polypus). They are really not true growths, but water-logged lining membrane from the nasal sinuses, especially the ethmoid sinuses. Breathing is very often blocked up and there may be a watery discharge from the nose. Removal of the polypi, which is a simple matter, may make a great difference to the patient's health and mental outlook. If they recur, a more radical operation may be necessary. A polypus may also occur in the ear or in the womb. (*See also* EAR; NOSE; WOMB.)



Nasal Polypi

POLYURIA.—The passing of an excessive amount of urine is known as polyuria. The normal amount passed in one day is about two and a half pints. Excess may be due to nervous causes when no treatment is required, or to some serious disease such as diabetes or inflammation of the kidney. There may be a temporary state of polyuria after fever. (*See also* DIABETES; NEPHRITIS; URINE.)

PONS.—The bridge of the brain which is chiefly composed of nerve fibres is referred to as the pons varolii. (*See also* BRAIN.)

PORTAL VEIN.—The large vein which enters the liver and which brings to it the blood from the abdominal organs. It is peculiar among the veins of the body because it starts in capillaries and ends in capillaries without going towards the heart.

PORT WINE STAINS.—Red birthmarks are referred to as port wine stains. (*See also* BIRTHMARKS.)

POST MORTEM.—This term, meaning after death, is used in connection with an examination of the body following death, of which the cause is uncertain or unknown.

POTASSIUM.—Potassium is a metal belonging to the alkaline group and many of its salts are used to a great extent in medicine. Potassium bicarbonate is often prescribed to be taken after meals when too much acid is present in the stomach, and it is of value in the treatment of acute rheumatism. Potassium acetate and potassium citrate are less irritating to the stomach than any other potassium salt and they are useful in the treatment of dropsy and acidity. Potassium bromide is largely used in the treatment of diseases of the nervous system and it is one of the most valuable drugs for the treatment of epilepsy. It may not actually cure a patient, but it will keep a patient free from fits whilst treatment is carried out. The drug is also given to relieve sick-headache. Potassium permanganate is an excellent antiseptic and disinfectant, and it is greatly used as a mouthwash and gargle, and also as a vaginal douche. For these purposes the water should be coloured a faint pink. Potassium iodide is given in a large number of diseases and is perhaps the most useful of all the potassium salts. It is invaluable in the later stages of syphilis; and is also prescribed in cases of rheumatoid arthritis, fibrositis, asthma and exophthalmic goitre. (*See also* BROMIDE; IODINE; NITRE.)

POTT'S DISEASE.—This term is frequently applied to curvature of the spine which results from tuberculous disease. Percival Pott (1713–1788), a famous English surgeon, was the first to describe the

condition. (*See also* SPINAL CURVATURE; TUBERCULOSIS.)

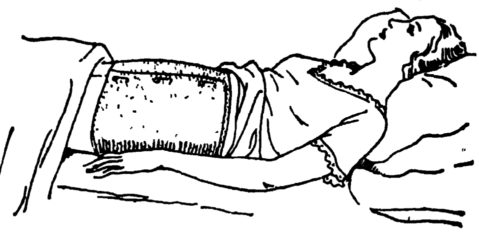
POULTICES.—Poultices are not so much used now as they were formerly, because antiphlogistine and similar preparations are so much easier and safer to work with. But as this is not always at hand when it is wanted, poultices have still frequently to be made. The commonest in use are made of bread, linseed, and mustard.

Bread Poultice.—Stir a sufficient amount of breadcrumbs into boiling water, beating well all the time. Cover bowl and place in boiling water until the bread is swollen. Drain off the water and spread evenly over a piece of linen or cotton. Turn the edges neatly in, spread the side to be placed next to the skin with olive oil or cold cream, then apply to the part. Try a corner first, in case it is too hot for the patient to bear. Cover with oiled silk and a bandage. Do not leave poultices on for more than four hours and have the new poultice ready to go on before removing the first.

Linseed Poultice.—These are made in the same way as bread poultices, but the linseed meal must be sprinkled gradually into the boiling water in order to avoid lumps.

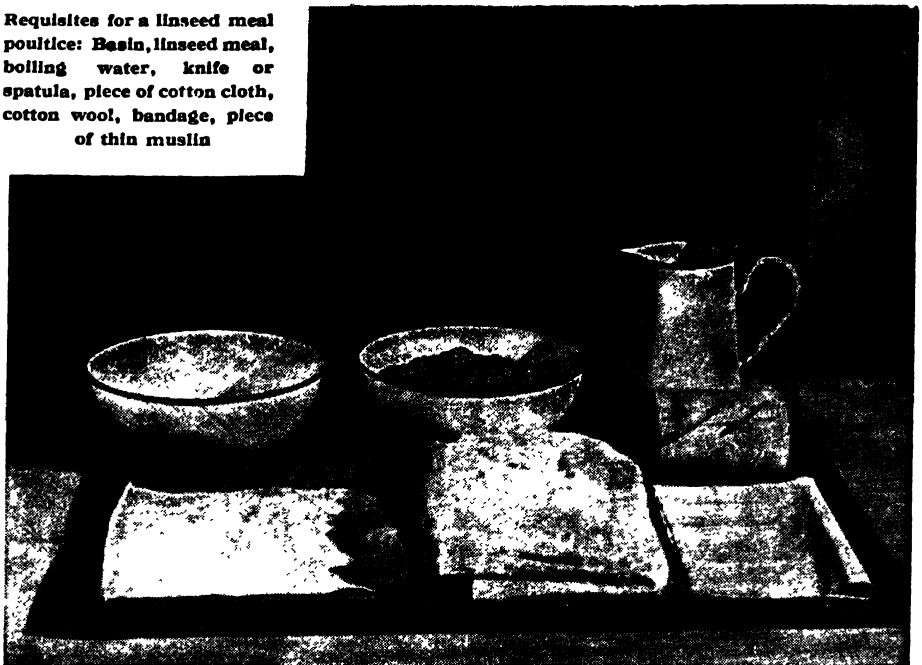
Mustard Poultices are linseed poultices with the addition of two tablespoonsful of mustard.

PREGNANCY.—Pregnancy is the state of being with child. The earliest symptom is the stoppage of the monthly periods, and the child's birth may be expected nine months and a fortnight from the first day of the last period. Some women, however, have reduced periods for three months after conception has taken place, and if they have not noticed the scantiness of the period, they may miscalculate when the birth is due. There is usually no doubt, however, after quickening has been observed. Quickening is when the movements of the child in the womb become so strong that the mother feels them; this usually occurs at four and a half months. After the stopping of the periods, the next symptom to be noticed is "morning sickness." A small quantity of clear tasteless fluid is vomited each morning on rising. There may be no feeling of nausea, the fluid being simply brought up. Sometimes this happens in the evening instead of in the morning; but once a day is the rule, and if there is a persistent vomiting during the day, or if the condition continues after the fourth month, a doctor's advice should be sought. The next symptom of pregnancy occurs in the breasts, which swell and may be painful. The veins are fuller and may show up blue on the chest. The nipples become more prominent and the area around them becomes darker in colour with raised pimple-like bodies on the brown part. During the first three months there may be a frequent desire to pass water, but this feeling disappears for a few months. When it returns, it usually signifies that the end of the pregnancy is very near. In the later stages of pregnancy there is a brown line running downwards from the navel, and there are lines of stretching on the abdominal wall which may remain as faint white scars after childbirth. These are called striæ. They may

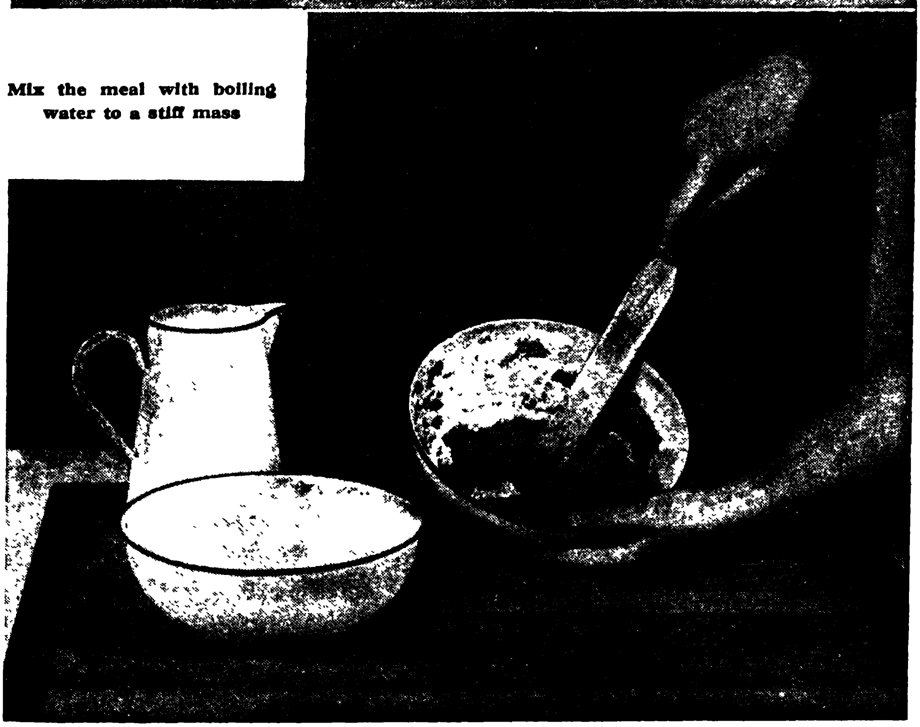


Abdominal binder

also be caused by any disease with great distension of the abdomen. During pregnancy there may be either constipation or diarrhœa, the digestion may be troublesome, and there may be heartburn or waterbrash. There may be a dislike for certain articles of food and a longing for others. The weight of the abdomen may cause swollen legs with varicose veins. There may be great trouble with itching of the genital organs and some women have a heavy white discharge. All these symptoms should be treated in a common-sense fashion as they arise and a little care will help to lighten any inconveniences. The danger signals which must be referred to a doctor at the earliest possible moment are bleeding, fits, albuminuria (the presence of albumin in the urine), and the stopping of the movements of the child in the womb. Bleeding may be the sign of a miscarriage, and albumin in the urine, or a sudden fit, may be the symptoms of the condition known as eclampsia. (*See also* CHILDBIRTH; ECLAMPSIA; LABOUR; PUERPERIUM.)



Requisites for a linseed meal poultice: Basin, linseed meal, boiling water, knife or spatula, piece of cotton cloth, cotton wool, bandage, piece of thin muslin



Mix the meal with boiling water to a stiff mass

A LINSEED POULTICE





Above:
Linseed paste spread thickly on cotton wool

Left:
Muslin laid on surface of poultice and edges of cotton cloth turned over



Right:
Poultice rolled up and laid between two hot plates ready for application. The poultice is held in position by the bandage

AND HOW TO PREPARE IT

PRESBYOPIA.—A condition of the sight which occurs as a natural outcome of old age is known as presbyopia. The structures of the eye lose their power of focusing properly, and near work becomes increasingly difficult. The use of spectacles is necessary to deal with the condition. (*See also* ACCOMMODATION; EYE; VISION, ERRORS IN.)

PRESCRIPTON.—The written directions ordered by a doctor for a patient containing a list of drugs and the method in which they should be taken or used, is called a prescription. Every prescription begins with the sign ℞, which is the first letter of the Latin word *recipe*, meaning "take." Then follows the names of the drugs and the quantity of each to be dispensed, along with any instructions to the chemist. Each prescription must be signed or initialled, and a prescription containing a dangerous drug must bear the name and address of the person for whose use the prescription is given. Many prescriptions are still written in Latin, though the custom is now falling into disuse. (*See also* APOTHECARIES' WEIGHTS AND MEASURES; B.P.)

PRESENTATION.—The part of the child in the womb which is in the position to appear first during childbirth is referred to as the presentation. In the most favourable cases the child presents the head, with its back directed towards the mother's front; this is known as the vertex presentation. Other presentations are described as brow, breech, shoulder, foot, or transverse and so on. In a breech presentation, the child present the buttocks, and a transverse presentation means that the body of the child lies across the opening of the womb. (*See also* CHILDBIRTH; LABOUR.)

PRICKLY HEAT.—Prickly heat, or miliaria, is a troublesome skin disease which affects Europeans in tropical countries. It is caused by excessive perspiration, which no doubt blocks up the tiny sweat-glands and produces an irritable condition of the skin. Anything that leads to perspiration, such as warm clothing, hot drinks, alcohol, heavy meals, etc., should be avoided as they tend to aggravate the condition.

Symptoms.—The rash, when it appears, takes the form of tiny vesicles or blisters which cause extreme itching and pricking. The condition is not in itself dangerous, but the scratching which follows may lead to the formation of boils or infected areas. The parts of the body which are most commonly affected are the waist, legs, back of hands, and forehead. In weak persons the irritation and loss of sleep caused by this condition may lead to serious consequences.

Treatment.—The most important point is to avoid anything at all that would tend to cause sweating. After the bath, in which no common soap should be used, the body should be carefully dried, then dusted with an antiseptic powder or any good dusting powder. To cure the rash, mildly antiseptic lotions should be applied, such as corrosive sublimate (a salt of mercury), lead, calamine, and weak solutions of carbolic acid. (*See also* MILIARIA.)

PRIMIPARA.—This term is applied to a woman bearing or giving birth to her first child.

PROBANG.—A rod-like instrument which is used for removing foreign bodies from the gullet is called a probang. The type generally used has a sheath of bristles at the end, which remain rod-like in shape while the instrument is being passed into the throat but can be made to spread like an umbrella as the instrument is drawn out, thus carrying the foreign body in front of it. Some doctors still use the probang, but many consider it out of date and even dangerous, preferring that foreign bodies in the gullet should be removed by a specialist with a special tube called the œsophagoscope. (*See also* FOREIGN BODIES; GULLET.)

PROBE.—A slender, flexible rod which is used for exploring the various channels of the body is known as a probe. It should never be used except in expert hands.

PROCESS.—The term process is used in connection with various projections or prominences of which there are some seventy or eighty about the body. Most processes are bony projections, but the appendix is sometimes referred to as the vermiform process.

PROCTITIS.—Inflammation of the rectum or anus is known as proctitis. (*See also* ANUS; RECTUM.)

PRODROME.—A symptom indicating the approach of a disease is referred to as a prodrome.

PROGNOSIS.—An opinion or forecast of the course, duration and ending of a disease is described as a prognosis. In stating whether the prognosis is good or bad, the doctor has

to take many factors into consideration. The health and habits of the patient, the response to treatment and the reputation of the disease are some of the chief points. (*See also* DIAGNOSIS.)

PROGRESSIVE MUSCULAR ATROPHY is a disease of the nervous system which occurs in middle life and which is much more common in men than in women. It is due, in the vast majority of cases, to a lack of stamina in the nerve cells which control movements, the "motor" cells, so that these die off whilst the rest of the nervous system is quite healthy. Death of these nerve cells leads to a gradually increasing weakness and loss of power in the muscles of the limbs, and in the course of a few years this weakness extends upwards to the muscles of the chest, throat and face. Patients attacked by this disease succumb to lung trouble, as the muscles which control breathing waste away and the patients are unable to breathe properly, or they may choke if unable to cough. Occasionally the symptoms of progressive muscular atrophy are caused by syphilis of the nervous system, and in these cases the outlook is much more cheerful; for, if the correct treatment is undertaken in time, the disease may be checked, and does not then usually progress.

The disease most commonly shows itself first by a wasting away of the muscles of the hand. The patient notices that he is not able to "make a fist" as easily as he could and it becomes difficult to separate the fingers. Later, the hand becomes drawn into a claw-like shape. Wasting of the muscles of the legs may be the next sign of the disease, and very often there is not only weakness of the legs, but they become very stiff. Difficulty in swallowing, in speaking and in moving the tongue are late symptoms and these cause the patient much distress. The muscles which move the lips are also attacked late in the disease, and so the lips cannot meet and the saliva drips from the mouth.

Treatment.—There are many different causes for wasting away of the muscles of the hands, and fortunately these are all more common than progressive muscular atrophy. But when this disease has been recognized, unless the cause can be shown to be due to syphilis, the only treatment is to help the weakened muscles to keep as much of their strength as possible by massage and electrical treatment, carefully given so as not to tire the muscles. When the muscles of the throat and chest are attacked, great care must be taken to prevent food getting into the throat instead of into the gullet, and so reaching the lungs. It is usually found that patients are able to take semi-solid food with more comfort and less risk than either liquids or completely solid food. (*See also* NERVOUS SYSTEM.)

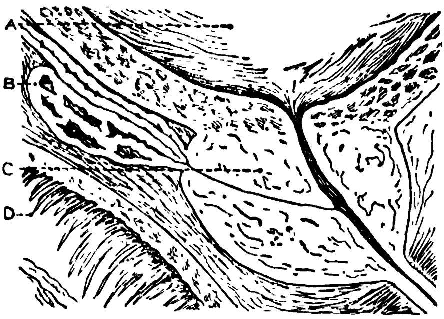
PROLAPSE.—The falling downward of some organ of the body from its normal position is called prolapse. Falling of the womb is perhaps one of the commonest forms of prolapse in women and it can be the cause of a great deal of suffering and unhappiness. This condition may be the result of injuries received during childbirth, but it is sometimes seen in elderly and unmarried women owing to lack of proper support of the pelvis. Satisfactory results can be obtained by operation, but if for some reason or another an operation is not advisable, the condition can be remedied by wearing a suitably shaped pessary. Wearing a pessary does not cure the condition but only holds the parts together as long as it is worn. Prolapse of the bowel should be treated by wearing a soft pad and bandage attached to the waist-belt. (*See also* WOMB; ANUS.)

PROPHYLAXIS.—The prevention of disease is known as prophylaxis, and any measures taken to prevent disease are known as prophylactic measures. Prophylactic treatment is now one of the most important fields of medicine and many diseases that were at one time fairly common are gradually becoming more rare and may soon be eliminated altogether. (*See also* INOCULATION.)

PROSTATE GLAND.—The organ surrounding the neck of the bladder and the beginning of the urethra in the male is known as the prostate gland. It is rather like a chestnut in shape and can be felt from the rectum behind. So far as is known its only purpose is to secrete a fluid that lubricates the urethra and is excreted with the semen. This gland is of importance, because in old age it is liable to increase greatly in size, thus causing obstruction between the urethra and the bladder. There is difficulty in passing water, which can only be overcome by inserting an instrument known as a catheter to draw off the water from the

bladder. An operation known as prostatectomy can be carried out, in which all or most of the enlarged prostate can be removed, so leaving a free passage for the urine. Inflammation of the prostate gland is known as prostatitis and it is usually the result of gonorrhœa, but it may also occur as a result of infection from the kidneys or bladder. The condition is a very painful one and the patient should consult a doctor as soon as possible. (*See also* GLEET; GONORRHŒA.)

PROSTRATION.—A feeling of extreme exhaustion and severe weakness is called prostration. One type of this condition is known as nervous prostration, which is much the same as neurasthenia. Other types of the



Prostate Gland:
A—Bladder; B—Seminal Vesicle; C—Prostate; D—Rectum

condition may be brought on by too much exercise, worry and shock, or owing to a prolonged illness. (*See also* LASSITUDE; NEURASTHENIA.)

PROTARGOL.—Protargol is a preparation of silver which is much used in the treatment of conjunctivitis (inflammation of the eye). Its main use, however, is in the treatment of gonorrhœa. (*See also* SILVER.)

PROTEIN.—Protein is an organic substance found in various forms in vegetable and animal life. Albumin, or white of egg, and gelatine are typical examples of a protein substance. For information as to the use of protein in the diet *see* SPECIAL SUPPLEMENT ON DIET AND INVALID COOKERY (p. 795).

PROTOPLASM.—The sticky material which is an essential part of all living cells is described as protoplasm. It is composed mainly of proteins, and the whole working of the body depends upon its chemical activities. (*See also* CELL; EVOLUTION.)

PROTOZOA.—Protozoa are the lowest form of life consisting of a simple cell (protozoon) or groups of cells. The protozoon, or amœba, is responsible for many diseases in man, the malarial parasite being one of the best known. (*See also* AMŒBA; GERMS; PARASITES.)

PROUD FLESH.—This is a popular name given to granulation tissue, which often arises in an ulcer which has become septic and inflamed. (*See also* GRANULATION TISSUE.)

PRURIGO.—Prurigo is a chronic skin disease, characterized by small rounded, reddish papules or pimples, which are intensely itchy.

Symptoms.—It chiefly affects the lower part of the abdomen, the buttocks, the back of the arms, and the front of the legs, but may spread over the whole body. It has some relation to urticaria (nettlerash), as it often begins as urticaria in early childhood, gradually changes to prurigo, and lasts indefinitely. The itching is so intense that the patient scratches incessantly, and the skin shows raw areas, scars, hardening pustules or little boils, and enlarged lymph glands. His sufferings affect his general health; he is nervous, "jerky," anæmic, with a poor appetite and constipation, and may finally have to give up business and social activities. Some cases become mentally deranged. A child so affected is pale, pot-bellied, round-shouldered, and prone to bad habits.

There are three forms of the disease: the mild, which is fairly common; the severe, which is uncommon; and the nodular, which is very rare and generally fatal. The first two are alike except in severity; the last is characterized by persistent itching nodules on the legs and arms.

Treatment.—The treatment of the first two forms is especially directed towards finding the underlying cause, which is thought (like urticaria) to be a chronic poisoning. The patient is very thoroughly examined. Some experts restrict the diet considerably, others allow generous meals, and cod-liver oil, etc. Iron tonics, thyroid extract, and iodine are helpful. Anti-itching ointment containing carbolic acid is very comforting, and seems also to have some curative value. Ultra-violet ray treatment also relieves the itching, and X-rays are even more successful.

Prurigo nodularis is treated by removal of

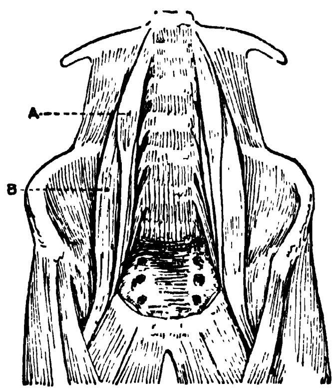
the nodules followed by X-ray treatment until the itching has entirely ceased. (*See also* SKIN.)

PRURITUS.—The term pruritus is used for all forms of itching, and this unpleasant and irritable state of the skin can be brought about in a great many different ways. Itching may be a symptom of many skin diseases, such as dermatitis, lichen planus, prurigo and urticaria, etc., and the scratching which naturally follows may set up a serious state of affairs. Contact with rough or woollen clothes is a common cause of itching, especially in children. Parasites, such as lice, etc., may bring about the condition, and the bites and stings of insects are also liable to prove troublesome. The skin condition known as "the itch," or scabies, is caused by a tiny parasite which burrows under the skin, but once the mite is destroyed the condition very quickly clears up.

Itching may be brought on through handling various substances such as flour, sugar, washing soda, etc., and these conditions are discussed under the heading OCCUPATIONAL SKIN DISEASES. The application of drugs to the skin may cause a rash or eruption, or exposure to sunlight may be the cause of much irritability. Some people are very sensitive to plants, and contact with the leaves or flowers, or even smelling the flowers, may bring on an attack of itching. Certain nervous diseases as well as diseases of the liver and kidneys may have itching as one of the symptoms. Sometimes an abscess at the root of a tooth or unhealthy tonsils may cause the blood to be upset which will lead to a state of irritation of the skin. Itching around the anus may be caused by piles, fistula, fissure, or the presence of threadworms, while itching around the genitals in women is commonly due to a discharge from the vagina. It should be remembered that itching is not a disease, but it may be the symptom of some abnormal condition, and if the itching continues the advice of a medical man should be sought. (*See also* DERMATITIS; OCCUPATIONAL SKIN DISEASES; LICHEN PLANUS; PRURIGO; PSORIASIS.)

PRUSSIC ACID.—Also known as hydrocyanic acid, prussic acid is contained in the oil of bitter almonds, but it can be manufactured by distillation of potassium ferrocyanide with dilute sulphuric acid. It is a strong poison undiluted, but is given dilute in small doses in dyspepsia, to quieten gastric pain, and to stop vomiting. It is commonly included in cough mixtures. (*See also* HYDROCYANIC ACID.)

PRUSSIC ACID POISONING.—If a large dose has been taken, symptoms usually make their appearance almost immediately. The patient becomes insensible, the eyes are fixed and glistening, and the skin is cold and clammy. Treatment consists of giving an emetic immediately or washing out the stomach with a tube. Artificial respiration must be carried out and ammonia may be applied to the nose, but treatment is not



Psoas Muscle:
A—Psoas Minor; B—Psoas Major

usually of much avail. (*See also* POISONS in FIRST AID SUPPLEMENT.)

PSITTACOSIS.—A contagious disease of parrots, which is sometimes communicated to man, is known as psittacosis. Restriction of the importing of parrots have caused it to disappear, at any rate for the time being.

PSOAS.—This name is given to a powerful muscle which arises from the spinal column in the back. It passes down and round the pelvis and through the groin and joins the inner side of the thigh bone. This muscle is brought into use in the act of bending the trunk forward or in flexing the thigh at the hip. Disease of the spine is very liable to lead to an abscess within the sheath of this muscle and the pus may travel down the fibres, and finally work its way into the upper part of the thigh. Such an abscess is known as a psoas abscess and it is usually the result of tubercular infection of the spine. (*See also* ABSCESS; TUBERCULOSIS.)

PSORIASIS.—Symptoms.—Psoriasis is a common chronic inflammation of the skin, characterized by rounded reddened patches of various sizes, which are covered with dry silvery scales. The eruption may be widespread, and appear as suddenly as a fever-rash, or there may be a few chronic patches. The scalp, ears, elbows, knees, and the back below the waist are the parts commonly affected; but psoriasis has been known to attack all parts, including the nails. Both sexes and all ages are affected; it is most common in young adults. The eruption appears in many varieties, and one of the chief features is a tendency to recurrence. The cause is unknown.

Treatment.—As internal treatment, very many drugs have been tried. Arsenic used cautiously is very useful in chronic cases, and sodium salicylate in acute. Potassium iodide, green iodide of mercury, and thyroid substance are sometimes successful.

Externally, chrysarobin in vaseline is by far the best treatment. It is rubbed in twice daily, baths being taken regularly to remove the scales. (The face and eyes are protected, as chrysarobin is irritating). About a fortnight suffices for a cure. The disadvantages are a temporary inflammation of the sensitive parts of the skin, and a permanent purple staining of the clothes. Carbolic 2 per cent. may be added to the ointment, but only used for a day or two at a time. Tar in any form is very safe; common gas-works tar, though unsightly, is a good though slow remedy. Salicylic acid and sulphur are useful in limited cases.

Hot sea-water baths and X-rays are good in some cases; others do not improve. Very widespread inflamed cases should be treated as dermatitis. The diet must be plain, and alcohol entirely avoided. Derangements of the general health should receive attention. Lastly, the patient should always be on the lookout for recurrences, especially on the scalp. (*See also* DERMATITIS.)

PSYCHOLOGY is the study of the mind and of behaviour. It has become of increasing importance during the past thirty years, since events like the Great War have shown that the mind and the body work together so intimately that the mind may actually cause bodily illness, and only when the condition of the mind is investigated and treated will the bodily illness get better. Another important aspect of psychology is the study of the development of the mind of the child. Formerly a naughty child was beaten or otherwise punished; nowadays an attempt is made to discover why the naughtiness occurs. Often some cause is found for the bad behaviour of a naughty child, such as an unhappy home life, or jealousy of an elder or younger brother or sister, and when the cause has been unearthed and the child is brought to realize why he or she behaves badly, the result may transform a difficult problem into a perfectly normal healthy child. (*See also* MIND; PERSONALITY.)

PSYCHONEUROSIS is a mental disorder which is akin to a neurosis but which is more difficult to cure, because the root of the trouble lies away back in childhood and it is only by the aid of prolonged psychotherapy that it can be traced. A psychoneurosis is said to be caused by incidents, or wishes which occurred in childhood and which, owing to their conflicting with the training of the individual, have been banished from consciousness to the unconscious mind, from which they are ever trying to escape. The battle between the "censored" wish or thought and the conscious mind may make itself felt as a psychoneurosis, of which the best example is one form of hysteria. (*See also* HYSTERIA; NEUROSIS; PSYCHOTHERAPY.)

PSYCHOSIS means a disorder of the mind, but in actual practice the term is restricted to the more severe forms of mental disorders, which will be found discussed under the heading of INSANITY.

PSYCHOTHERAPY is an essential part of the treatment of all minor disorders of the mind, and of some of the more severe ones, but it must be combined with rest and the necessary bodily treatment of the patient to achieve a perfect result. The basis of all psychotherapy is to explore the patient's mind; to find out the origin of the mental symptoms; to recognize the source of the trouble and to help the patient to rearrange his ideas for a better adaptation to the events of daily life. There are three main methods used in psychotherapy, though in any particular case, more than one may have to be employed.

Suggestion is the power that some people have of impressing their views, and their will,

on others. Some folk are able to suggest by their very presence that all will be well with a patient, and it is such as these who become famous physicians. Suggestion is of value in psychotherapy only in as far as the patient is consciously aware of his mental difficulties; it is of no value in the psychoneurosis, in which the trouble is in the unconscious mind.

Hypnotism has already been fully discussed under its own heading and can therefore be dismissed here with the note that it is a mental state in which suggestion is more easily accepted than in the normal state. It is of value in curing the bodily symptoms of hysteria as a preliminary measure to discovering the true cause of the hysteria. It is also of value in curing imaginary pains and in producing sleep.

Psycho-analysis is an attempt to bring long-forgotten experiences of the patient's childhood to light and to associate them with his consequent experiences and troubles. By this means such buried (or repressed) incidents assume their rightful proportions among the events of a person's life and no longer lie seething in his unconscious mind. They therefore cease to be the source of the mental distress which has given rise to his particular symptoms. So much nonsense has been written in recent years about the method of psycho-analysis, that a brief description of the way the method is carried out will be given. The patient is first physically examined thoroughly and the full history of his mental trouble and symptoms are recorded. He is then asked to lie down on a couch and to relax his muscles as much as possible. The analyst sits behind the top of the couch so that the patient does not see him at all. The patient then is requested to speak any words which come into his head, whatever they are, and whether they are apparently of little importance in his estimation. The analyst suggests nothing to the patient; the patient does all the work; the analyst only asks such questions as are needed to link up the words the patient uses. Often a patient will lie silent for some time, and then will disclose some vital fact which has hitherto been concealed under the mask of shyness or of fear. Especially in that condition known as "Anxiety" is it found that ideas concerning sex, often not very far removed from consciousness, are the true cause of the fear. It is the duty of the physician who practises psycho-analysis to overcome his own prejudices on this subject and to allow the patient to discuss with him the mental aspect of sex as naturally as he would discuss a pain in his stomach. As sex is one of the primitive instincts which has to be controlled by the dictates of modern civilization, it is not surprising that, on analysis, only too often is it found that sexual problems are the essential cause of the mental trouble. Once the fact has been realized, it is simple to direct the patient's energies so that social activities provide suitable substitutes for individual selfishness. The method of psycho-analysis is, of necessity, a slow form of psychotherapy, and many interviews may be required before the real cause of the patient's symptoms is unearthed. No single interview can last longer than one hour; it would be too much strain on both patient and physician. The other criticism that has been levelled at this method is that the female patient is liable to "fall in love" with the psycho-analyst. As a matter of fact, the great majority of women patients are analysed by women doctors and of those who are treated by men, nearly all take a strong dislike to the doctor after about the second interview, because they are afraid they have "given themselves away." This attitude of dislike sometimes persists up to the end of the treatment, but is usually replaced by a neutral attitude which is invariably the attitude aimed at towards their patients by all qualified psycho-analysts.

PTERYGIUM.—This is a non-inflammatory disease of the conjunctiva, which has been so named because it is supposed to resemble the wing of an insect (Greek, pteron, a wing). A triangular semi-transparent web of tissue forms upon the cornea, the base of the triangle being at the margin, outer or inner, and the apex growing towards the centre. It is thought to originate from repeated "attacks" of pinguecula. It is far more common in hot climates, where it grows thicker and more fleshy than here. It occurs in people whose work exposes them to dust, as millers and stone-cutters; or to all weathers, as sailors, coachmen, and chauffeurs. (*See also* Eye, Muscles of.)

Treatment.—Any defect in vision should be corrected as far as possible. If the pterygium has become stationary in growth, and has not encroached seriously on the

cornea, it is better to leave it alone; if, however, it is growing, and tends to interfere with sight, it must be removed by operation. (*See also* CORNEA; EYE.)

PTOMAINE.—A form of poisoning due to eating decomposed food is known as ptomaine poisoning. (*See also* BOTULISM; FOOD POISONING.)

PTOSIS.—Drooping of the upper eyelid is known as ptosis. If this condition is present at birth it is usually due to maldevelopment of the muscle that lifts the eyelid; if it occurs later on in life, it may be due to paralysis of the muscle. (*See also* EYE; EYELID.)

PTYALIN.—Ptyalin is the name of the ferment contained in the saliva by which starchy foods are turned into sugar in order to aid digestion. (*See also* FERMENTS.)

PUBERTY.—The period in which the child gradually passes into manhood or womanhood is called puberty. (*See also* ADOLESCENCE.)

PUBIS.—The bone that forms the front part of the pelvis is called the pubis or pubic bone. (*See also* BONE.)

PUBLIC HEALTH.—This term is used for the department of medicine which concerns itself with preventive medicine and the health of the community. It is controlled by the Ministry of Health but most of the work is carried out by local authorities. (*See also* INFECTIOUS DISEASES; NATIONAL HEALTH INSURANCE; NOTIFICATION OF DISEASE; OCCUPATIONAL DISEASES; QUARANTINE; SUPPLEMENT ON CHILD WELFARE.)

PUERPERIUM is the time between the birth of a child and the restoration of the mother to perfect health, and usually lasts about a month. During this time the womb, from being big enough to hold an infant, has to regain its normal size of a pear, and the discharge from it, blood-stained at first, gradually becomes clear and then stops altogether. The breasts, which are of course enlarged in pregnancy, begin to secrete milk in quantity during the puerperium, generally beginning two or three days after the child has been born. It is usual for a mother to remain in bed for the first ten days of the puerperium, though some specialists nowadays say that this is quite unnecessary and allow the patient up almost at once. For the first two or three days the mother should have a milk diet only, but after that should return to ordinary food, with plenty of fluids.

PULEX.—A species of the common flea which is found on the skin of man and animals. The pulex cheopis, the rat flea, is supposed to convey the plague infection from rats to humans. Pulex irritans is the scientific name for the common flea. (*See also* JIGGER.)

PULMONARY.—Anything pertaining to or affecting to the lungs is described as pulmonary. (*See also* LUNGS.)

PULSATION.—The throbbing caused by the beating of the heart is called pulsation and it can be felt, and sometimes seen, on the left side below the fourth and fifth ribs. Pulsation may also be felt where an artery lies close beneath the skin, but abnormal pulsation or beating may be a sign of aneurysm (swelling of an artery). Pulsation can often be felt in the upper part of the abdomen, especially in thin people, due to the throbbing of the abdominal aorta.

PULSE.—The pumping of the blood through the heart causes changes to take place in the blood-vessels, and each time blood is pumped through, the arteries swell and then contract again; this is known as the pulse. At each heart-beat, from four to six ounces of blood are pumped into the aorta, the largest artery of the body, and the wave of this fluid is carried along to all the other arteries. The pulse can be felt in any artery that lies near the surface; but the artery which runs over the bones of the wrist is chosen for this purpose. The examination of the pulse affords valuable information to the doctor. He is able to find out the state of the artery as regards its hardness, etc., and the rate of the pulse tells him much about the action of the heart. The pulse rate is usually about 72 beats per minute, but it varies a great deal in different people. Some people may have a normally quick pulse, while others are habitually slow without affecting the health in any way. To take the pulse, hold a watch with a seconds hand, in the left hand, and place the three fingers of the right hand on the front of the forearm, about one inch above the furrows of the wrist and about half an inch from the outer edge. The pulse beats are counted for one minute. At the same time, the quality of the pulse is marked, whether it is full and bounding, rapid and

thin, or feeble and soft. A rapid pulse occurs in fevers, certain diseases of the heart, and nervous disorders. In typhoid fever, the pulse becomes very slow, and this is recognized as one of the symptoms of the disease. An irregular pulse is one where some beats are felt more strongly than others. It may be present in heart disease, but it may also be due to indigestion, or anything which upsets the nervous system such as over-indulgence in alcohol, coffee or tobacco. There is a type of irregular pulse common in young people, and also people recovering from infectious diseases, in which the pulse rate is affected by the breathing, but it is not a harmful condition. (*See also* BRADYCARDIA; HEART.)

P.U.O.—These letters stand for pyrexia of unknown origin, and they are used as a convenient term for cases of fever the nature of which is still in doubt. (*See also* FEVER.)

PUPIL.—The pupil is simply a hole in the iris of the eye, which is composed of two layers of muscle. One layer is arranged in circular fashion, and on contracting diminishes the size of the pupil; the other radially, which on contracting increases the size of the pupil.

The pupil is *contracted* in cool, self-possessed individuals, old age, bright light, near work, and sleep. It is *dilated* in emotional persons, such states as anger, pain, and fear, and a dim light. Certain drugs have the power of altering its size; and in some diseases its size is a very valuable help in diagnosis. (*See also* EYE.)

PURGATIVE.—Drugs or other methods which are used to produce an action of the bowels are known as cathartics or purgatives. A large number of substances act as purgatives and they are grouped according to the nature of their effects. The mildest types are known as *aperients* or *laxatives*, and they gently stimulate the bowels and render the motions slightly more frequent without causing any griping. *Simple purgatives* such as cascara sagrada, castor-oil, aloes, etc., produce more copious and more liquid movements often accompanied, or preceded by, griping pains. *Drastic purgatives* cause a violent action of the bowels accompanied by considerable griping, and since they remove a considerable quantity of water from the system, they are also known as *hydragogues*. Most of the important drugs are dealt with under their own titles. (*See also* APERIENT; CATHARTIC; CHOLAGOGUE; CONSTIPATION; DIARRHŒA; HYDRAGOGUES; LAXATIVE.)

PURPURA.—Purpura consists in an eruption of reddish-purple spots, due to escape of the blood from the vessels into the skin or mucous membranes. It is a symptom rather than a disease in itself, and is produced by various causes. There are several types: (1) petechiæ, which are tiny surface spots at first bright red, later brownish; (2) ecchymosis or bruise, which is a deeper and more extensive hæmorrhage, forming an irregularly rounded black-and-blue patch, which becomes yellowish and fades; (3) hæmatoma, which is a pool of blood in the tissues. If large enough it forms a soft "tumour."

Simple purpura consists in mild petechial eruptions, occurring chiefly in childhood and affecting principally the legs and the inside of the mouth. The spots appear suddenly, last for a few days, and gradually fade. Successive crops may appear for several weeks or months. In a few cases the child feels "out of sorts," but is never definitely ill. A similar condition occurs in old age.

Henoch's purpura also occurs chiefly in children, and is associated with vomiting, diarrhœa, and stomach pains; sometimes with pains in the joints and inflammation of the kidneys. It is thought to be due to increased sensitiveness to certain foods.

Purpura rheumatica. In these cases the spots may be accompanied by "nettlerash," nodules, or even blisters; this variety is often classed with erythema. There is sore throat, fever, and pains in the joints. In severe cases there may be pleurisy or various heart affections.

Purpura hæmorrhagica includes cases of a severe, often fatal, type, in which petechiæ, ecchymoses and hæmatomas are all found. Bleeding is extensive, and occurs into the skin, mucous membranes and brain; and possibly from the gums, stomach, bowel or kidneys. This chiefly affects young girls, and lasts for some weeks. In a mild form it may exist for years.

Secondary purpura is produced by very many conditions. It may occur in some skin diseases, e.g. erythema, drug eruptions, shingles; in fevers, e.g. measles, scarlet fever,

small-pox, spotted fever and typhus; in blood-poisoning, malaria, influenza, tuberculosis, syphilis, anthrax and hæmophilia (bleeder's disease). It may also occur where there is obstruction to the blood-flow, e.g. asthma, varicose veins.

Treatment.—The treatment depends on the underlying cause. Rest in bed, with the legs raised, is advised in the first groups of cases. There are no special remedies. Calcium lactate, 20 grains three times daily, is generally given. Salicylates relieve pain in rheumatic cases. Injections of coagulin, which increases the clotting power of the blood, may be used, and blood transfusion is necessary in severe cases. (*See also* ERYTHEÆA.)

PUS.—Pus, or matter, is a thick fluid which is found in abscesses, ulcers, and on any inflamed and discharging surfaces generally, consisting of bacteria and broken-down tissues. The colour may vary from white to greenish-yellow according to the type of germ causing the condition. The odour, too, may vary a great deal for the same reason, while much depends on which part of the body is affected. A discharge containing pus is spoken of as a purulent discharge. (*See also* ABSCESS; BOIL; CARBUNCLE.)

PUSTULE.—A small abscess appearing on the skin or mucous membranes is called a pustule. They almost always appear as a symptom of some other disease, the most common, perhaps, being acne vulgaris. Smallpox and anthrax also are diseases characterized by the appearance of pustules. When the pustules eventually dry up there is always a certain amount of scarring left; this is particularly noticeable after smallpox. (*See also* ACNE; ANTHRAX; SMALLPOX.)

PUTREFACTION.—The decomposition that takes place in dead animal and vegetable matter is called putrefaction. It is due to the action of bacteria or germs, and in the course of the process various poisonous and offensive substances are formed. (*See also* DECOMPOSITION.)

PYÆMIA.—A form of blood-poisoning in which abscesses appear in various parts of the body, to which infection has been carried, is known as pyæmia. The symptoms of the disease resemble those of septicæmia. (*See also* SEPTICÆMIA.)

PYELITIS.—Inflammation of the part of the kidney known as the pelvis, the upper end which is connected with the ureter, is described as pyelitis. The infection is usually carried to the kidney from the bladder, or germs may be present in the blood and carried directly to the kidney from the blood-stream. Pyelitis and cystitis (inflammation of the bladder) usually occur together. Pyelitis is fairly common in children, and the condition is more frequent in females than in males.

Symptoms.—There is a great deal of feverishness and sweating, and nervous symptoms such as convulsions and stupor may be present. There is pain in the region of the loins, vomiting and headache, and there is usually a desire to pass water at frequent intervals.

The urine is cloudy in appearance and, on examination, a large number of pus-cells will be found.

Treatment.—The patient should be confined to bed and the bowels cleared by means of a purgative. The administration of citrate of potash or other alkalies in large doses gives relief from the symptoms and is the most effective way of clearing up the inflammation. Urinary antiseptics may have to be given. Good results have been obtained by the use of vaccines prepared from the actual germs found in the urine. (*See also* BACILLURIA; KIDNEY; NEPHRITIS.)

PYLORUS.—The tube-like part of the stomach through which the partially digested food passes on into the duodenum is known as the pylorus. The duodenum is the first part of the small intestine. (*See also* DUODENUM; STOMACH.)

PYOGENIC BACTERIA.—Germs which cause the formation of pus and so lead to abscesses and boils, etc., are known as pyogenic. There are many types of germs included in this group, but by far the most common are known as the staphylococci and streptococci. (*See also* GERMS; PUS.)

PYONEPHROSIS.—This is a condition in which pus is found in the kidney. (*See also* HYDRONEPHROSIS; KIDNEY.)

PYORRHŒA.—Pyorrhœa is a disease of the gums which may cause serious upset to the general health by the absorption of poisons by the blood-stream and by the constant swallowing of the poisons discharged into the mouth. It is due to a germ (or, more accurately, an amœba) infection

and it attacks all ages and conditions of people, but those in good general health with carefully tended mouths will not be so liable as others. The teeth should be put in order by a dentist and antiseptic paints, tooth-pastes, or mouth-washes used freely. If this is not sufficient to clear up the condition, vaccines may be tried, and if they fail, it may be necessary to remove the teeth, but this should only be the very last resort. (*See also* DENTAL DRILL; GINGIVITIS; GUMS, DISEASES OF.)

PYRETHRUM.—The tincture of pyrethrum, prepared from the flowers, is used for killing household pests such as fleas and bugs and it can be dabbed on the hands to keep off insects. Pyrethrum root, or pellitory, is used to stimulate the flow of saliva in cases where the mouth is abnormally dry.

PYRETIC TREATMENT.—The method of treating rheumatic complaints by means of artificially raising the temperature and inducing free sweating is described under the name of pyretic treatment. Hot baths and electrical treatment are included in this method of treatment. (*See also* BATHS; ELECTRICITY IN MEDICINE; RHEUMATISM.)

PYREXIA.—An abnormal rise in temperature, or a feverish condition, is referred to as pyrexia. (*See also* FEVER.)

PYROGALLIC ACID.—Pyrogallic acid is a powerful antiseptic, but it is too poisonous to be used internally. It is used on the skin as an ointment for the treatment of chronic psoriasis and it is also excellent for cases of ringworm. It should not be applied over too large an area of skin as it may be absorbed through into the system. Pyrogallic acid stains the skin a deep brown colour and it is used in many hair dyes.

PYROSIS.—More commonly known as water-brash or heartburn. This is a condition due to over-acidity of the stomach. The attacks usually come on shortly after a meal has been taken and there is a hot feeling in the stomach and an over-flow of saliva into the mouth. (*See also* HEARTBURN; INDIGESTION; WATER-BRASH.)

PYURIA.—This term is used to describe any condition in which there is pus in the urine. (*See also* URINE.)

QUARANTINE.—The term quarantine is used in connection with the length of time which the patient, or a person who has been exposed to an infectious disease, must be separated from other people. The length of time depends on the type of disease, as in some cases, especially scarlet fever, the patient may be infectious for a long time after the usual quarantine period is over. The importance of quarantine is especially great in connection with school children. The term quarantine is also used in connection with the length of time in which a ship that is carrying an infectious person on board must be kept free from personal contact with the shore. In the old days if a ship put into port with an infectious case on board, the crew and passengers were quarantined, or detained, for about forty days. This state of affairs proved to be too irksome to travellers and trade, and nowadays arrangements are made for a special mooring-place where passengers from a ship which is unable to present a "clean" bill of health can be landed. All passengers must undergo a medical examination before they are allowed to land, and all actual and suspected cases are taken to hospital. Names and addresses of all the passengers who land are taken and forwarded to the medical officers of health of their various districts, so that everyone can be kept under observation until any danger of an outbreak of the disease is over. (*See also* INCUBATION PERIOD; INFECTIOUS DISEASES.)

QUARTAN FEVER.—This is a particular type of malaria which comes on every fourth day. (*See also* MALARIA.)

QUASSIA.—Quassia is a bitter, stimulating tonic which is obtained from the wood of the trunk and branches of a tall tree which grows in South America and the West Indies. Quassia is given in cases of slight indigestion and it is often given as a tonic along with iron. It has been given as an anthelmintic, the name used for a drug which has the power of killing intestinal worms. It is mainly used to get rid of threadworms which inhabit the lower part

of the bowel. (*See also* APPETITE; BITTERS; DIGESTION.)

QUICKENING.—This term is used to describe the feeling of movement inside the womb caused by the unborn child. (*See also* CHILDBIRTH; LABOUR; PREGNANCY.)

QUICKLIME.—Calcium oxide, or quick-lime, is used to make lime water, which is often added to milk for infant feeding, as it makes the milk more digestible. For the other uses of quicklime *see also* CALCIUM.

QUICKSILVER.—This is the popular name for mercury, which is a fluid, silvery metal of great mobility. The salts and other preparations of mercury are among the most important drugs we have. (*See also* MERCURY).

QUILLAIA.—Soap bark, or quillaia bark, obtained from a tree which grows in Chile, is used by the Chilians as a substitute for soap. Syrup of quillaia is used in cases of bronchitis, pleurisy, and for making emulsions. (*See also* EMULSION.)

QUINIDINE.—This drug is obtained from cinchona bark and it is closely related to quinine. Besides being of use in the treatment of malaria, it is a very valuable drug in cases of auricular fibrillation, a heart disease in which the beats are tremulous and irregular. (*See also* CINCHONA; QUININE.)

QUININE.—Quinine is a very important alkaloid drug obtained from several species of cinchona bark. The best-known use of the drug is in the treatment of malaria, and it is usually taken by the mouth unless ordered to be injected by the doctor. Quinine will not only cut short an attack of malaria, but it is capable of preventing one if taken about three hours before the attack is due. There are many preparations of quinine, but it is generally used in the form of one of its salts, such as the sulphate of quinine, hydrochloride of quinine, or tannate of quinine.

Quinine is a powerful antiseptic, and it is capable of destroying germs and preventing fermentation and putrefaction; but, unfortunately, it is far too expensive for ordinary use. It is often given in small doses for cases of neuralgia, and it is sometimes useful in the early stages of cold in the head and bronchitis. In fevers, sulphate of quinine may be given to lower the temperature, though it should never be given when the heart's action is feeble. As a tonic, small doses may be taken after meals either liquid or in tablets, or it is more commonly taken with other tonic substances such as iron and strychnine. (*See also* MALARIA.)

QUINSY.—An abscess in or around the tonsil. (*See also* TONSIL; TONSILLITIS.)

RABIES.—An illness which is caused by a bite or lick from an animal suffering from a serious infective disease. Dogs, cats, horses, cattle, etc., may be afflicted with this complaint. In man it is known as Hydrophobia. (*See also* HYDROPHOBIA.)

RADIO-ACTIVITY.—A property possessed by certain substances, including the elements Radium, Uranium, Thorium, Polonium and Cadmium, of spontaneously giving off radiations or rays which are capable of penetrating substances which the ordinary rays of light cannot penetrate. Various waters and soils contain salts of these elements in very small quantities, and these are said to be radio-active. Part of the radiations given off by radium are known as *Radon*, which behaves like a gas, and it is known that definite dosage of *Radon* has a good effect in a variety of disorders. (*See also* RADIUM.)

RADIOGRAPHY or SKIAGRAPHY.—Means a photograph taken by means of X-rays. Other names given to this form of photography include photography by the Röntgen-rays, skotography, skiagraphy, radiography, electrography, etc. A skiagram is not an actual photograph, but is really a silhouette of an object which is denser than its surroundings. (*See also* X-RAY.)

RADIOTHERAPY.—It is recognized in a general way that the rays given off by radium have a close physical, chemical and biological affinity with those possessed by X-rays. From the point of view of treatment, however, the rays of radium are much superior. There is also a far greater advantage in the fact that the radium rays can be applied to parts of the body which cannot be reached by X-rays.

The apparatus containing radium rays can be made in any shape: disks which are square, rectangular or round; others concave or convex; others cylindrical or spherical; some rigid and others flexible, etc. A varnish

containing the salt of radium and as hard as enamel covers them. The proportion of radium contained in the varnish is usually one centigram per square centimetre.

Small tubes in glass and metal are also made which can be introduced into tumours themselves: these tubes contain the radium inside, and owing to their small diameter can be placed in contact with tumours by natural passages such as along the food pipe or œsophagus, the urethra, rectum, etc. A tumour can be attacked by the radium tubes inside as well as by applying it outside. However the rays are employed, the absence of any reaction or the degree of this reaction is in direct proportion to the dose applied, that is to say to the amount and length of time the radium is given.

Radium treatment of extreme activity should not produce any irritating effect, even on chronic skin conditions; but, on the contrary, should cure the dermatitis without any irritation, if the duration of the application is sufficiently short; e.g. not longer than three minutes. The general principle is to use the rays with a feeble penetrating power for slight skin troubles, and the rays with more penetrating power for deep-seated growths. By this last method, if the doses are well calculated, it is possible to have a great effect on the deeper tumours without irritating the skin.

The diseases which are often treated in this way are certain forms of cancer—epithelioma. Birth-marks, some forms of lupus, chronic itching, scars which are very prominent and overgrown (keloids), and a condition of the tip of the nose known as *Rhinophyma*; are some of the more well-known examples. (*See also* RADIUM.)

RADIUM.—A white metallic element belonging to the group of alkaline earths which also include Barium, Calcium, Magnesium and Strontium. It is found in pitchblende together with Uranium. For medical purposes a salt of radium is usually employed. The bromide of radium is a soluble salt, while the sulphate is an insoluble one.

The element radium, without appearing to receive any energy from surrounding substances, gives off in a constant fashion a large quantity of energy in the form of gas emanation, heat, electricity, etc., and in spite of this, pieces of the element have been kept for several years and have not apparently lost any weight. These are facts which appear to be contrary to certain fundamental laws of physical science. The gas given off is known as an *emanation* and is called *Radon*. It is used for medical purposes. It follows the laws common to all gases. It can give surrounding substances a temporary radio-activity—induced radio-activity. (*See also* RADIO-ACTIVITY.)

It is now known that Radium is derived from Uranium by a gradual splitting up of the uranium atom. In a similar way the energy which Radium possesses is derived from a splitting up of its atomic structure, and the ultimate product is Lead.

The emanations of radium are subdivided into what are known as α (alpha) and β (beta) rays; definite atoms which are given out at a very great speed. The sending out of the α and β rays causes waves in the ether which in turn give rise to γ (gamma) rays, which are similar to X-rays.

The α-rays are relatively few in number and have a poor power of penetration. Their effect is only on very slight conditions. The β-rays are emitted in large numbers and are mixed from the point of view of their powers of penetration, some being nearly as weak as the α-rays, and others being able to penetrate one millimetre of lead. The β-rays seem to play the principal part in medical treatment, because not only can they be used as suggested, but also for their production of the secondary X-rays. Each time a γ-ray passes through a substance, the emission of a β-ray has been produced. A theory based on this fact is that the γ-rays have an effect on the tissues of the body chiefly by the secondary production of β-rays which transmit heat and negative electricity. The γ-rays are much fewer and and have a very great power of penetration (up to 10 centimetres of lead). (*See also* RADIO-ACTIVITY; RADIOLOGY; RADIO-THERAPY.)

RADIUS.—The radius is one of the two bones of the forearm, the part between the elbow and the wrist. The radius is slender at the top, and has a shallow, cup-like end which moves freely over a rounded surface on the lower end of the humerus, the bone which joins the elbow with the shoulder.

It is much bigger at the lower end, and joins with the two bones of the wrist. If we rest the forearm flat on the table, with the palm of the hand uppermost, this is called

"supination," the radius and the other bone of the forearm, the ulna, are now parallel with each other. If we now turn the hand round till its back is uppermost ("pronation") the ulna does not change its position, but the lower end of the radius has turned round this bone, crossing it, and carrying the hand with it. Thus the upper slender end of the radius rotates on a pivot formed by the rounded portion of the lower end of the humerus, and is held in this position by means of a circular ligament, while its lower end revolves round the ulna. This ability to pronate and supinate has been the means of a great advance in civilization, especially in regard to man's inventions.

The most powerful muscle of the arm, the *biceps*, is inserted into the radius, and when this muscle is contracted with the elbow flexed, it causes supination, and as the right arm is usually stronger than the left that is the reason why most screws have a right-hand thread.

Fractures of the Radius.—One of the commonest fractures through the lower end of the radius is known as a *Colles' fracture.* It occurs through falling on the palm of the hand with the arm stretched out. The deformity caused by the fracture is often referred to as a "dinner-fork" deformity; the hand is drawn towards the thumb side, and there is a swelling on the back of the wrist and another on the front, below which there is a noticeable depression. In a young person the growing end or epiphysis may be separated by a fall of this type and give the typical appearance of a Colles' fracture.

The anatomical position of the arm is assumed to be with the arm hanging down by the side and the palm facing forwards, so that the radius is on the outer side. All descriptions are made on the assumption that the arm is in this attitude. In this way the adjective "radial" means anything on the outer or "radial" side of the arm. The radial artery is the outer of the two branches into which the main artery of the arm (the brachial) divides. At the wrist it lies just under the skin and to the radial side or outer side of the outer of the two prominent tendons of the front surface of the wrist. It is here that the pulse can easily be felt. The name of the radial nerve used to be applied only to the nerve supplying the skin on the radial side of the back of the hand, but it is now applied as well to the whole of the musculo-spiral nerve. (*See also* ARM; COLLES' FRACTURE; FOREARM.)

RAILWAY SPINE.—This phrase is applied to a variety of spinal symptoms which may result from slight injuries or concussion received in a railway accident. The condition is a form of neurasthenia. It is sometimes the cause of litigation, and until the claim for compensation has been dealt with finally, there is very often no improvement, although after settlement, improvement will take place whether the verdict is for or against the litigant.

RALE.—A sound which is produced in addition to the normal sounds in the lungs caused by the movements of air to and fro through the bronchial tubes during the act of breathing. In various forms of disease the air tubes or air cells may contain some liquid substances, and when the air passes past the fluid clicking or bubbling noises are produced. Abnormal cavities in the lungs containing fluid will also cause extra noises.

Dry rales are also known as *rhonchi* and are produced by a partial blocking of the passage, either due to a swelling of the lining membrane, or to the presence of tough secretion. The pitch of the note varies according to the size of the opening through which the air can pass; the smaller the passage the higher the note. These dry sounds are characteristic of bronchitis, but may be found apart from definite bronchitis, e.g. in certain cases of consumption, etc.

The **moist rales**, also known as *crepitations*, sound like the bursting of smaller or larger air-bubbles, and indicate the presence of fluids in the air cells or tubes.

The finer crepitations are caused by the opening up of the collapsed air cells whose walls have become stuck together by a little fluid. This at first makes them stick together, but as the air pressure gradually increases during inspiration, they at last separate suddenly, and allow air to enter. The separation of the walls is accompanied by a cracking sound, which can be imitated by separating the moistened fore-finger and thumb near the ear. When this condition occurs in a number of air cells, the combined effect is to produce a fine crepitation.

RAMUS.—A branch, especially of a vein, artery or nerve. It is a term also applied to a piece of bone which projects like a twig

or branch from a larger piece, as for instance a part of the lower jaw.

RANULA.—A cystic swelling under the tongue. It is generally due to the blocking up of one of the ducts of one of the two sub-lingual salivary glands. The obstruction is usually due to a stone or calculus. It grows slowly without giving any signs of its presence at first, till it becomes awkward on account of its size and interference with speech or swallowing. The tongue may be bitten during mastication. The swelling disappears if the wall is punctured and the contents allowed to escape. The treatment is by removal of the cyst, walls and all, otherwise it is liable to recur. (*See also* CALCULUS; SALIVARY GLANDS.)

RAT-BITE FEVER.—This is a peculiar disease which may follow a rat-bite. It has been known in China and Japan for several centuries. It is caused by a germ known as a Spirillum, which is long and wavy in outline. There is a long time, possibly months, between the bite and the development of the fever. The wound, which has run an ordinary course and has perhaps healed, becomes swollen, red, and forms an ulcer. The fever sets in suddenly with a chill and lasts from 3 to 4 days. When it starts there is a rash somewhat like measles. The patient feels very ill and has pains in the muscles and joints. After a few days the temperature falls and the patient feels well. After an interval varying from a few days to a couple of weeks the attack is repeated, and this may go on for several months.

The treatment is to cauterize the wound and to give one of the organic arsenic preparations, such as salvarsan, which is so effective in syphilis, also a condition due to a spiral type of germ. The fever is treated in the usual way.

RATS.—Beavers, dormice, hares, marmots, porcupines, rabbits, rats, squirrels and moles all belong to the same order in the animal kingdom, the order of the rodents, or animals that gnaw. Rats, mice and moles are of one family within this order.

The common black rat is believed to have come originally from China. He has been almost driven out by his powerful and cunning cousin, the so-called Norway rat, also believed to have come from Asia.

Other kinds of rat known to naturalists include the bamboo rat, the bandicoot rat, the cane rat, the crested rat, the fish-eating rat, the jerboa rat, the kangaroo rat, the long-nosed rat, the great mole rat, the musk rat, the Philippine rat, the pouched rat, the rise rat and the shrew rat.

Rats and Disease.—Whenever a ship comes into the docks from foreign countries it has to be carefully inspected, and precautions have to be taken against any tropical disease being brought into this country. Among these diseases is plague, and plague is carried by rats. The discovery that this is so was made some twenty years before the Great War broke out, and an official publication says that the essential cause of epidemics of plague is the "plague-stricken rat," and that the agent between rat and man, and between rat and rat, is the rat flea.

Among preventive measures against plague is the destruction of rats. In the year that the Ministry of Health was established (1919) and took over duties of public health in England and Wales, a Rats and Mice Destruction Act was passed. Scotland, through its Department of Agriculture, has its own organizing officer under the Act.

RAYNAUD'S DISEASE.—The disorder described by the famous French physician, Raynaud, is characterized by disturbances of the circulation in various parts, especially the fingers and toes. There is apparently no organic disease of the arteries, and the interference with the blood supply is due to the nerves controlling the size of the blood-vessels. The condition is comparatively rare; in one series of cases there were 19 cases out of 20,000 medical patients treated. It is more common in damp and in cold weather, and is practically unknown in warm climates. There is a widespread spasm of the arteries and smaller blood-vessels so that not a drop of blood enters the part affected. Sometime later the blood-vessels open out widely and the dead white finger becomes bright pink. There is often a stage in which the part is blue between the white and the pink stages.

Curiously enough in frost-bite the order of events is reversed. In frost-bite the part becomes pink, then blue, and finally white; whereas in Raynaud's disease the part becomes white, blue, and then pink. In moderate grades of the blue stage some little blood trickles through the sluice gates; but

in the deep purple skin of a typical example the circulation has ceased and death of the part is imminent. The death of that part is a simple matter, as simple as if a string were tied tightly about the finger-tip.

There are various grades of the disease; in the mild forms the disease is never worse than the condition seen in ordinary chilblains. In the more severe forms the individual concerned, usually a woman about 25 years of age, after a period of worry or ill-health, may have pains in the fingers. She then notices that they are white and cold, and in an hour become red and hot. Then in a day or two a change occurs; they become permanently blue, perhaps as far as the second joint or to the knuckles. The pain may be so bad as to necessitate morphia. The blueness becomes worse and there may be a few blisters on the skin. The other fingers regain their normal colour, but death has occurred in the pad of one finger and perhaps the terminal inch of another. The dead portion gradually separates, and the patient may never have another attack, or a year or two later may have a recurrence.

A more severe form may also affect the fingers, toes, tip of the nose and ears. The pain is very severe. Both feet may be swollen to the ankles and the toes may be quite black. Fortunately the results are much less severe than were apprehended, and only a small portion of the ends of the fingers or toes are actually destroyed.

Treatment.—The tendency of this disease should be countered, if possible, by warm clothing in the winter. The gloves, shoes, etc., must be sufficiently loose not to cause any constriction of the circulation. A tight glove will often cause a very cold feeling, which it is worn to prevent. The mild attacks require no treatment. In the more severe forms the parts affected should be wrapped in cotton-wool and kept at rest. The use of calcium lactate, nitroglycerine, etc., prove useful in some cases. Galvanism and ultra-violet light are additional forms of treatment. If gangrene occurs, the parts affected must be kept covered with antiseptic dressings.

An elastic bandage, or better, a pneumatic tourniquet, should be applied to the part sufficiently tightly to shut off the blood supply for a few minutes. On releasing the constriction the arm or leg flushes brightly, owing to relaxation of the blood-vessels. This may have to be repeated several times in cases of severe spasm. (*See also* CHILBLAIN.)

REACTION.—This term is used in medicine in different connections. A chemical reaction is a process in which original chemical substances are changed into others. Chemical reactions are always going on in the body and are very complicated in character.

Reaction also applies to the response of some tissue to a stimulus. For instance, a bright light shining into the eye will make the pupil contract. There is always a definite period of time between the application of the stimulus and the response; this is known as the reaction time. The quality of the mental powers of attention and decision may be tested by directing a person to do something on being given a certain signal, his powers being judged according to the length of his "reaction time."

Reaction is also used to denote an opposite and contrary state: for instance, a person who is at first unduly excited and elated and then becomes depressed is said to suffer from reaction.

The reaction of degeneration is one shown by muscles cut off from connection with the nerve centres when stimulated by an electric or other source of energy. (*See also* ELECTRICITY, MEDICAL.)

RECTAL DOUCHE.—Hot or cold water is introduced into the bowel through the anal orifice; it can be inserted by means of an ordinary enema apparatus or Higginson's syringe, or by means of a rubber tube attached to a funnel. The end of the rubber tube is inserted and the funnel is raised until the fluid flows in. In both forms of apparatus it is important to see that all the air is driven out of the tubing first. Where there is any possibility of inflammation inside the bowel, the tube and funnel method is preferable to the Higginson's syringe, as there is less likelihood of the fluid pressure doing any damage. The patient usually lies on his left side with the hips raised.

At various foreign watering resorts, such as Plombières, Vichy, etc., regular washing out of the bowel has been instituted as part of a course of treatment (hence the name Plombières treatment). At these places the natural mineral waters are used and the patient lies on a bed which is connected with a water-closet. These facilities can now

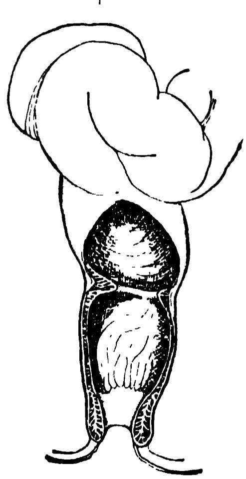
be obtained at any English spa and, indeed, at clinics in many of our cities. (*See also* Douche; Irrigation.)

RECTAL FEEDING.—A certain amount of fluid is absorbed from the large bowel under normal conditions, and it is this process which renders the motions, or stools, more solid than they are at the end of the small intestine (*see* Digestion). There is also a certain amount of muscular contraction which pushes the contents backwards (anti-peristalsis). Solutions of glucose undergo some absorption, as the glucose is the sugar which is normally the end product of all starchy food and is absorbed as such into the blood-stream. Other ingredients may include milk which has been peptonized or digested for 24 hours; if peptonized for a shorter time it is quite useless from the point of view of absorption. The fluid must be at body temperature when it is introduced into the bowel, and should be about 100° F. in the vessel containing it. It is best given by means of the tube-and-funnel method. The rubber tube is most satisfactory when shaped at the end like a catheter, e.g. has a blind end and an opening at the side near the end.

RECTIFIED SPIRIT (Spiritus Vini Rectificatus), or more shortly S.V.R., consists of 90 per cent., by volume, of alcohol. The spirit is a very powerful solvent for drugs and is used to make tinctures and other medicinal preparations. Owing to the duty of alcohol, however, it is very expensive and substitutes are used wherever possible. For instance, methylated spirit is used for lotions and liniments which are applied externally only.

RECTOCELE.—A weakness of the wall of the rectum which shows itself as a protrusion in a woman, of the front wall of the rectum through the back wall of the vagina which lies immediately in front. It is most liable to occur after the birth of a child when the structure between the back portion of the vagina and the anal orifice, known as the perineum, is damaged, and no longer offers a support to the walls of the rectum, It rarely occurs by itself, but is usually associated with a general looseness of all the structures, and if of a mild degree can be treated with a support, such as a pessary for the uterus; but if severe a repair operation is indicated.

RECTUM.—Is the end part of the bowel. It extends from an S-shaped bend, known as the sigmoid flexure, down to the anus and opens at the exterior by means of the anal orifice. It is over six inches in length. It lies in the cavity of the lower portion of the backbone, the sacrum and coccyx. Just before reaching the exterior the walls are more distended and the area is known as the ampulla. This can vary greatly in size and is able to contain large quantities of fæcal material. The anal portion is surrounded by two sets of muscle; the inner one is a thickening of the normal circular muscle fibres of the bowel and is under involuntary control. It is known as the internal sphincter. Outside this is a voluntary muscle under the direct control of the conscious mind and it is known as the external sphincter.



Rectum

There is a network of blood-vessels in the lower portion of the rectum. The blood from the veins which form a part of this plexus goes, some direct to the heart, and the rest to the liver. Any congestion of the liver is thus likely to lead to a swelling of these veins and hence to the formation of piles. It is the entrance of fæces or stools into the rectum which gives rise to the desire to evacuate them. A reflex action tends to relax the internal sphincter, but sensory impulses also pass to the cerebrum (the conscious portion of the mind) and this enables one to control the external sphincter, and this will overcome the natural reflex to go to stool when circumstances are not suitable provided the impulse to go to stool is not too strong.

Diseases of the Rectum.—Foreign bodies include solid accumulations of fæcal matter. This occurs usually in old men, paralytics and in the insane. Sometimes there is a core consisting of a stone, fruit stone or intestinal worm. These foreign bodies produce a sensation of discomfort and heaviness, and colic and pains in the loins

and legs. There is also a constant and frequent desire to go to stool, usually without any result except a few drops of mucus due to the straining. The treatment is to give a rectal douche to soften the mass and then a suitable aperient. If there is complete paralysis of the muscle of the bowel it may be necessary to remove the foreign body with a curette.

False teeth, bones of mammals or fish swallowed may all pass as far as the rectum, and there, if they have sharp or rough edges, may give rise to tears in the mucous membrane with subsequent abscess formation.

Cancer of the Rectum is not common before the age of 40. At first there are very few signs. Thin streaks of blood may be noticed. If the growth is fairly high up the rectum any hæmorrhage may show itself by the passing of tarry stools, as the red colouring matter of the blood has become altered during its passage to the exterior. There may be pain and difficulty in passing the motions, alternating diarrhœa and constipation. The motions are sometimes narrow or ribbon-like in character if the growth is circular in the wall of the bowel and narrows the passage markedly. Straining may produce the passage of mucus; and the growth will interfere with the return flow of blood in the veins and give rise to piles. General symptoms are anæmia and wasting. The growth may ulcerate into the neighbouring structures, such as the bladder or vagina. The condition lasts from one to two years and causes death by progressive poisoning, uræmia or other diseases.

Treatment.—The only treatment which offers any hope is complete surgical removal. The result of this depends on the stage at which the operation is carried out. If too far advanced for surgical removal, radium and X-rays are useful in relieving the more distressing of the symptoms.

A polyp is a simple, non-malignant growth which grows from the wall of the rectum and is attached to it by means of a stalk or pedicle. It is more common in children and grows very slowly. Its presence is indicated by the passage of blood from the rectum, straining at stool without effect, and the presence of a tumour inside. This simple growth is readily removed by the simple operation of burning or cutting through the stalk.

Rectal prolapse means the passage through the anus of some portion of the wall of the intestine. It is common in infants when the external muscles are weak. It is aggravated by constipation. In old people, piles and polypi cause much straining and chronic diarrhœa which eventually weakens the muscles at the opening of the rectum.

When rectal prolapse is marked there is a long rounded tumour which is red and moist. In the child, attention to the consistency of the motions and injection of the bowel with astringent lotions will usually result in a cure. It may be necessary in the case of elderly persons, if the condition is at all severe, to cut out the loose mucous membrane. In certain cases the wearing of an apparatus to retain the rectal walls will be necessary.

Inflammation of the rectum, or *proctitis*, usually follows inflammation of the large intestine. If it is due to local trouble, the cause is usually inflamed piles, venereal infections, eczema, foreign bodies, immoral practices, drastic purgatives, etc. There is much pain and agonizing straining. The condition may heal up, or become chronic. Abscess formation, ulceration, the development of a fistula and stricture formation are all possible complications.

A stricture of the rectum may result, apart from a new growth, from any previous inflammation. Chronic obstruction gives rise to a similar train of symptoms. The original cause of the condition must be treated and dilatation of the stricture by the passage of instruments, or even a cutting operation, will be needed. (*See also* COLITIS; INTESTINE.)

REDNESS OF SKIN.—Due to the small blood-vessels or capillaries in the skin becoming filled with blood. (*See also* BLUSHING; DERMATITIS; ERYTHEMA; RASH.)

REDUCTION.—Means to put a thing back into its proper place. In surgery the replacement of a broken or dislocated bone into its correct position is known as reduction. Emptying the contents of a hernial sac or rupture is another form of reduction. It is also a term applied to chemical changes. (*See also* DISLOCATION; FRACTURE; HERNIA.)

REFLEX ACTION.—An unconscious act which is controlled by the spinal cord without the intervention of the will. When the skin of the soles of the feet is tickled the feet are drawn away. In a frog, for instance, this

will take place even when the *cerebrum* is completely destroyed. The stimulus passes to the spinal cord (afferent impulses) and these in turn cause further stimuli (efferent impulses) to pass to the muscles of the leg and so draw it away.

A more delicate reflex of the soles of the feet is obtained by stroking the outer side of the sole, when the big toe, and the others as well, will become flexed so that the sole of the foot becomes more concave. In some diseases of the nervous system such tickling will result in extension of the toes instead of flexion.

A reflex action of a mucous membrane is well illustrated by the effect produced by tickling the back of the throat with a feather, when retching or even vomiting will occur.

The knee-jerk is an example of a deep reflex or tendon reflex rather than a superficial one, which is caused by irritation of the skin. It is obtained by making the patient sit on a chair and crossing one leg over the other. The one which is crossed should be hanging loosely, and the tendon should be tapped smartly just below the knee-cap. In a normal individual the leg below the knee will jump forward due to the contraction of the muscle which ends in the tendon tapped —the quadriceps extensor. This jerk is exaggerated if the path from the brain to the spinal cord is damaged, thus cutting off control by the will. It is absent entirely if there is any disease of the reflex path, as occurs in tabes, etc. (*See also* KNEE-JERK.)

REGENERATION.—The restoration of diseased or injured tissues to their original state. When damage to a tissue is so marked as to cause definite destruction, actual regeneration is rare. Repair usually takes place by the formation of scar or fibrous tissue. A nerve can, in favourable circumstances, regenerate by means of a fresh growth from the healthy end, but it may be as long as six to nine months before the new portion works normally.

REJUVENATION.—It has been found that both the ovaries and the testicles, in addition to their evident functions, have an "internal" secretion. That is one which is absorbed directly into the blood-stream and is not collected into any definite duct. It appears to invigorate both body and mind. In the case of a male, tying the duct which leads from the testicles will cause the reproductive cells to waste away, but the blood supply present goes to the cells known as "interstitial cells" which make this internal secretion, and the supply of this is increased. Steinach and Voronoff have experimented on animals, particularly on the higher apes, and in some cases have succeeded in grafting the testicle of an ape into the scrotum or the abdominal cavity of a man. The secretion of this gland will cause a temporary rejuvenation, but occasionally the blood-vessels of the new organ have actually become connected with the blood-vessels of the man, and the grafted organ has lived for some time. The good effects, however, do not last for a long time.

Good results in either sex are claimed for several preparations of various sexual and other ductless glands. Those which are injected under the skin appear to have more effect than those taken by mouth, but they are rather expensive, and require to be taken in fairly large doses. Nor is their action certain enough to make the claims accepted by doctors in general. (*See also* DUCTLESS GLANDS.)

RELAPSE.—The recurrence of a disease after convalescence has apparently begun is described as a relapse. As a rule the symptoms of the relapse are exactly the same as those of the original attack, but milder in character. They are very common in such diseases as typhoid fever, but are practically unknown in others, such as measles, etc.

RELAPSING FEVER.—This is an infectious illness due to a germ of the spirochætal type, that is it has a long wavy outline when seen under the microscope. It lives in the blood, and is transmitted by lice through scratch marks in the skin. This disorder is characterized by recurring bouts of fever lasting for several days and separated by periods of normal temperature of about the same duration. In Africa it is also known as "Tick Fever," because the tick there is responsible for conveying the parasite. Besides the louse and the tick, the bed-bug may possibly act as a carrier. It has occurred in Ireland and on the shores of the Baltic, and from these it has spread to England, Scotland, India and Germany. Young people are most frequently attacked.

Symptoms.—The illness begins suddenly with a chill, extreme weakness, violent pains in the head and marked backache. There

may be vomiting. Jaundice may occur, but the stools retain their normal colour.

These symptoms last from 3 to 10 days, usually 6, and then suddenly disappear with marked sweating and the copious passage of urine, and the temperature becomes normal and the patient wants to get up. This normal state lasts from 3 to 15 days, and then a new attack begins. This usually lasts a slightly shorter time than the first. The second attack ends in the same sudden way. This relapse may occur three times, sometimes more, and ultimately a cure is the rule. Sometimes there are lung complications and hæmorrhages. Miscarriages in pregnant women are common.

Treatment.—Preventive measures include the destruction of lice and other animals liable to convey the parasite. Organic arsenic compounds, such as sulpharsan, etc., are of value against all the spirochætal type of germs. A special serum has been made. General treatment for the fever and heart stimulants are also indicated.

RELAXED THROAT.—This term is often used to indicate a chronic inflammation of the throat, or chronic pharyngitis. This state of affairs is often due to external causes, such as excessive smoking, eating or drinking food which is too hot, or the irritation caused by chronic nasal catarrh. These causes should be remedied, and locally astringent gargles, sprays, etc., can be used. Tonics are very useful, and a few days' holiday in a bracing district will often effect a cure. (*See also* PHARYNGITIS; TONSILLITIS.)

REMITTENT.—When the temperature fluctuates considerably, but does not drop down to normal limits, the fever is said to be of the "remittent type." One form of malaria is often referred to as *remittent fever.*

RENAL.—Something belonging to the kidney. One can speak of renal function, meaning the duties of the kidney; renal diseases, or diseases of the kidney; renal calculus, or stone in the kidney, etc. The paroxysms of pain caused by the passage of a stone down from the kidney to the bladder along the ureter are known as renal colic. Renal insufficiency means that the kidney is not doing its work properly, either by getting rid of the waste solids or fluids from the blood-stream. (*See also* KIDNEY.)

RENNET.—There is a substance present in the normal digestive juice found in the stomach which has the property of clotting milk. It is known as rennin. It is associated with pepsin and the hydrochloric acid in the digestion of the proteins. It can be obtained from the stomach of the calf and is sold commercially under the name of rennet and is used for the making of junket.

These enzymes or ferments are most active at body temperature, 37° C. or 98·4 °F. and are destroyed by boiling. It is common knowledge that the preparation of rennet is not effective if the milk is allowed to boil. (*See also* FERMENTS.)

REPRODUCTIVE SYSTEM.—In the *male* the reproductive system consists of the testicles, which secrete the seminal fluid containing spermatozoa, the vas deferens or duct of the testicle, the seminal vesicles, in which the fluid is stored, the prostate gland, the urethra, and the penis. In the *female* the reproductive system consists of the ovaries, which give rise to the ova, the Fallopian tubes, which convey them to the womb, the womb or uterus, the vagina or passage up to the womb, and the external genitals.

RESCUE AND PREVENTIVE HOMES.—Rescue Homes, which were the first to be founded, are designed for the help of girls and women who, through ill-fortune, have "gone on the streets." Preventive Homes, which are generally regarded nowadays as being far more useful in their permanent effects, help younger girls (as a rule), and those who are in bad moral surroundings, though not actually prostitutes.

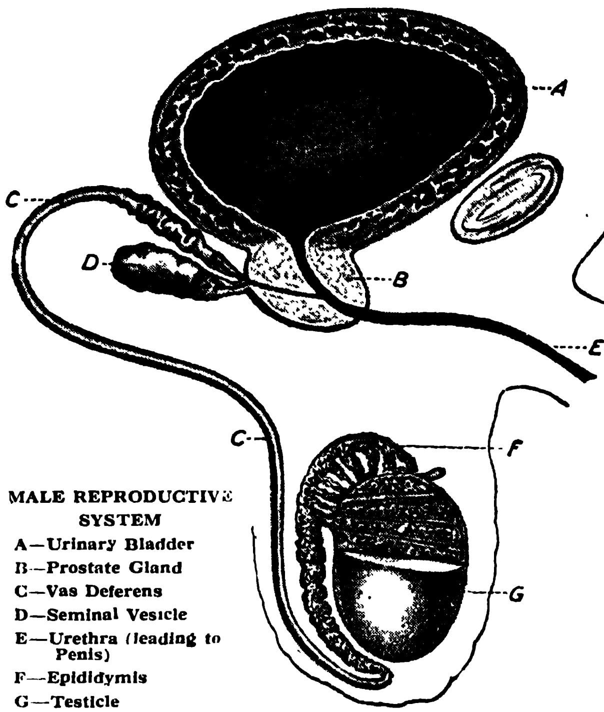
Broadly speaking, the Homes shelter and clothe the girls, and train them to earn their living decently. Domestic and laundry work are often done, but, if possible, a girl is trained for any special work she chooses. The average stay in the Homes is two years. Venereal disease, when present, is treated.

RESIN.—Resin is a semi-solid inflammable substance which oozes out of the stems of certain plants and hardens into a solid mass on exposure to air. In Nature this sticky sap may be combined with an oil, in which case it is called an *oleo-resin*; or with a gummy substance, when it is called a gum-resin. If it is combined naturally with benzoic or cinnamic acid it is known as a *balsam.* There are many balsams used in medicine and they are described under their own heading. Various resins are used as medicines, the commonest being jalap, guaiacum

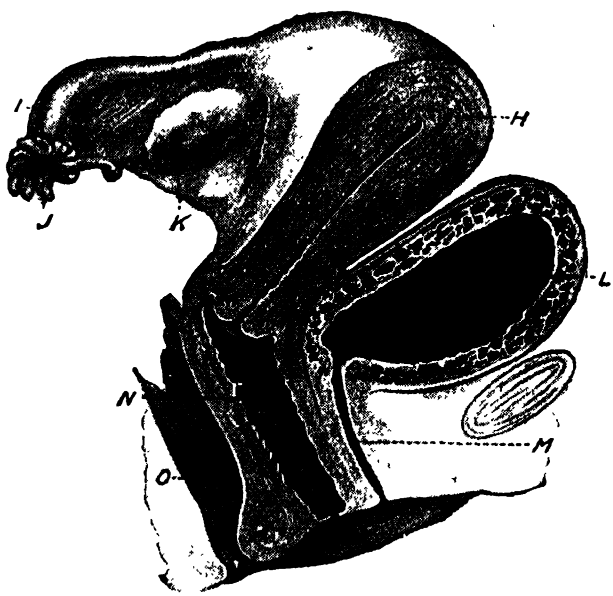
and podophyllum. Resins are also very useful in making plasters, including the ordinary adhesive plaster and the various resin ointments. The substance commonly called resin, or rosin, is the residue left after abstracting oil of turpentine from the saps of the various species of pines. (*See also* BALSAM; GUM; TURPENTINE.)

RESORCIN. — Is a white crystalline substance which is antiseptic in its action. It is easily soluble and is chiefly used in skin conditions where the skin needs stimulating to throw off an unhealthy growth and promote a sound new growth. In conditions such as acne, seborrhœa and dandruff it is very useful. It can be used as a lotion in solution or is handy in the form of an ointment. When applied to the hair it must be used with care in case it stains light hair, and it should not be used to paint over a large tract of skin as it is poisonous and too much might be absorbed by the skin.

RESPIRATION. —Respiration is the act of breathing by which the living animal, whether human being or animal, exchanges the gases which it manufactures in itself for the gases in the air around it in which it lives. This exchange



MALE REPRODUCTIVE SYSTEM
A—Urinary Bladder
B—Prostate Gland
C—Vas Deferens
D—Seminal Vesicle
E—Urethra (leading to Penis)
F—Epididymis
G—Testicle



FEMALE REPRODUCTIVE SYSTEM
H—Uterus or Womb
I—Fallopian Tube
J—Fimbria or opening of Fallopian Tube K—Ovary
L—Urinary Bladder
M—Urethra
N—Vagina
O—Rectum

of gases is absolutely necessary to the maintenance of life, since the gases breathed out carry poisonous waste materials out of the body, and the gases breathed in bring oxygen which is food for the tissues of the body. In cases where breathing has been suddenly stopped as the result, for example, of an accident, such as the clogging of the lungs with water, efforts are made by means of the treatment called *artificial respiration* to continue the action of breathing until the lungs can take it up again of their own accord. This treatment very often saves the person's life. In certain very severe illnesses, such as pneumonia, where the patient is suffering because not enough oxygen can be taken in by breathing to keep him going, it is possible to give him additional oxygen to breathe by means of a cylinder of the pure gas unmixed with the other gases which make up the air.

The Act of Respiration.—Respiration, or breathing, really consists of two parts, breathing in and breathing out, which are called respectively *inspiration* and *expiration*; and the organs which help to carry out these two actions form the *respiratory system*, or breathing apparatus, as it is commonly called.

Respiratory System.—The respiratory system includes the larynx, the trachea, the two main bronchi and the two lungs; all of these are described elsewhere under their own headings. The nose (and in some cases the mouth) are the entrances by which air gains access to the body, but they can be dispensed with as far as the actual act of breathing is concerned unless they are impassibly blocked up so that air cannot pass through. The larynx, or voice box, is the upper part of the respiratory tract. Its position in the front of the neck is recognizable by the jutting-out junction of two of the plates of cartilage which form the larynx, and which is popularly known as the *Adam's Apple*. Its medical name is the thyroid cartilage. Below the larynx comes the long passage of the *trachea*, or windpipe, which carries the air to and from the left and right *bronchi*, or bronchial tubes. Immediately below the larynx the trachea is crossed by the narrow part of the thyroid gland joining its two lobes, which lie one on each side of the neck. Below these again the trachea enters the chest and divides into two branches, one going to the left lung and one to the right. These two branches are called the *bronchi* or bronchial tubes; these lead to the *lungs* and divide and sub-divide into smaller and smaller tubes. The lungs are two in number, and fill the chest on each side of the breastbone below the shoulder. They act as the filters and machinery by which the oxygen is withdrawn from the air and passed into the blood-stream, and the impurities and waste materials which are to be discarded from the blood by way of the lungs are given off. The process by which this is accomplished is a very complicated one and is described in the articles on the BRONCHI and CIRCULATION OF THE BLOOD.

Act of Breathing.—As has been said above, respiration really consists of two separate actions. Breathing in or inspiration, and breathing out or respiration. The chest may be looked upon as a sort of bag which, when full, expands, and, when the air is driven out, contracts. *Inspiration* is brought about by the contraction of the muscles of the chest and the diaphragm. The chest muscles expand the ribs and the diaphragm presses down the organs in the abdomen; this results in a negative pressure or "pull" inside the lungs, which is relieved by air passing through the respiratory passages of the nose and throat. The lungs are lined by a membrane called the *pleura* between them and the chest wall, and the inner surfaces of the pleura are lubricated by a serous fluid which allows the act of respiration to take place without any undue friction.

Expiration takes place when the muscles relax and allow the ribs to contract by reason of their own elasticity. The abdominal organs then push the diaphragm up again to the chest, and air is driven out of the lungs until the pressure in the lungs is the same as in the surrounding atmosphere. Then the process of inspiration begins again and is automatically followed by expiration. (*See also* ARTIFICIAL RESPIRATION.)

RESPIRATOR.—During the Great War, respirators had to be worn as a protection against poisonous gases. In industry there are certain occupations in which it is advisable to wear a mask. These are occupations in which much harmful dust is apt to be breathed or some dangerous chemical. The special instrument which is applied over the face of a person who is being anæsthetized is also sometimes called a respirator

REST.—The body requires rest at intervals from its labours if it is to carry out its duties satisfactorily. For the general machinery of the body the rest obtained by the hours of sleep is sufficient for the normal person, but whenever any part of the body becomes weakened by disease or excessive fatigue it will require an extra amount of rest. The heart can never stop its labours for any length of time without death taking place, so a special arrangement is made for it to obtain rest by its system of beats, which is in effect, pump, rest, pump, rest, etc. In conditions where an extra amount of work is going to be put on any part of the body, such as the heart in serious illness, the first procedure the doctor insists upon is rest, obtained by means of putting the patient to bed. Nature, if left to her own devices, insists upon rest for sick or injured people by making them fall to the ground and lie quietly there, even to the extent of making them unconscious, if they still persist in their efforts to resist resting. For acute diseases of the alimentary tract, such as gastric ulcer, rest is obtained by fasting or, at any rate, a very restricted dietary.

For complete rest in bed, all worries, business details, and tiring visitors of one sort or another must be excluded, and it is essential that the patient should not leave his bed even to answer the calls of Nature; a bed-pan or urinal must be brought to him, and the bed must be made while he is still in it.

It used to be very popular to order a patient to undergo a "rest-cure." This was usually on the lines of the Weir-Mitchell treatment, and included a life of vegetating in bed with little physical or mental exertion, combined with a full milk diet. Nowadays, a more popular treatment is a rest-cure in the form of a voyage or "cruise" of some duration, during which the affairs of ordinary life must of necessity be left behind, and bodily activity can be restricted to lying in a deck-chair in the fresh air on deck. For neurasthenics, the rest-cure is often best if accompanied by massage or electrical toning-up treatments.

RESTLESSNESS.—An output of energy which fulfils no purpose, and is not under the control of the will. The causes of restlessness may be either bodily or mental. In most people any grave acute illness, like pneumonia, for example, is accompanied by great restlessness, in fact, in any condition, in which the nervous system is made more irritable, restlessness may occur. It is one of the chief features, therefore, in confusional insanity and in acute mania. In children in whom the nervous system has not yet been brought under such control as it has in adults, slight digestive upsets, intestinal worms or adenoids will produce a picture of a restless child who is always "on the go." Worry about schoolwork, and overtiredness after strenuous games are also very common mental causes of such restlessness in children. When the cause is an obvious one care should be taken that the last hour of the waking day is spent pleasantly and not in doing arrears of homework. Exhausting games should be prohibited just before bedtime and a fairly substantial, but easily digested, meal should be given within a couple of hours of bedtime. If the cause of restlessness cannot easily be detected, such bodily ailments as worms, enlarged tonsils and adenoids or a mild form of St. Vitus's dance must be considered. These, of course, need expert treatment. (*See also* INSANITY; MANIA.)

RETINA.—The innermost coat of the eye-ball, which is sensitive to light, is called the retina. If the retina becomes inflamed the condition is called *retinitis*. (*See also* EYE.)

RETRO.—Retro, before a word, means behind. Thus a retro-pharyngeal abscess is an abscess in the tissues behind the throat. Retroversion means the turning backwards of an organ such as the womb, and retroflexion means the bending back of a part of it.

RHATANY.—Preparations of the roots of a South American plant called Krameria are used sometimes in cases of diarrhœa. Lozenges containing rhatany are used for relaxed throats.

RHEUMATIC FEVER.—*See* RHEUMATISM, ACUTE.

RHEUMATISM is a generalized or localized infection of the system, caused by germs and the poisons they produce in the blood, and the symptoms are usually made worse by exposure to cold, damp and fatigue. It takes various forms which must be described separately. Acute Rheumatism is more

often known as rheumatic fever. Chronic Rheumatism is commonly called rheumatism quite simply. Muscular Rheumatism or Myalgia and Rheumatoid Arthritis are other forms.

Rheumatism, Acute.—Acute Rheumatism, commonly called rheumatic fever, is a severe attack of rheumatism accompanied by fever which may have serious complications and should be treated with great care. It used to be supposed that it was caused by exposure to cold and damp, but during the war, when many people endured great hardships from cold and damp, rheumatic fever was not as prevalent as it might have been supposed. It is therefore likely that the disease is due to an infection by germs, but is made worse by cold and damp. Probably the germs gain an entrance through the throat or intestines and pass into the blood-stream where they settle in various places such as the heart, the joints, or the brain, etc. There is a distinct tendency for the disease to run in families, probably because these families have a lowered resistance to it. Children and young people are the most usual victims and females have it more often than males. It is most prevalent amongst poorly nourished and poorly housed people, though sometimes it appears in epidemic form usually attached to an influenza epidemic. Children who have had one attack of rheumatic fever are liable to have recurring attacks and should be carefully watched.

Symptoms.—A child may slip into an attack of rheumatic fever gradually without the beginnings of the attack being noticed. The child may be out of sorts, complaining of pains in the limbs, and if the temperature is taken it will be found to be slightly raised. "Growing pains" are now generally supposed to be rheumatic in origin and should be taken as a warning. One day the child will become acutely ill, with a temperature of 100° F. or over, and there is acute pain and swelling in a joint, or several joints. Sometimes as one joint subsides another may swell. In most cases there is a good deal of sweating and the sweat has a characteristic sour smell. There may be sore throat. Sometimes rheumatic nodules or little lumps are found under the skin in such places as the back of the hands, chest, over the knees, at the elbows and so on. These nodules or swellings may come and go quite quickly. The temperature, with proper treatment, will usually return to normal in about a week or ten days, and the pain will fade out of the joints, although it may go from joint to joint.

Treatment.—Rheumatic children should have their throats and teeth well cared for and any unhealthy teeth or tonsils should be removed as they render the child more liable to an attack of rheumatic fever. When the attack occurs it is of the greatest importance to put the child to bed and keep it there, not allowing it to get up at all, or even to have more than one pillow. The bed-pan should be brought to it. A doctor will be necessary, as the child is in danger if rheumatic fever is neglected. The salicylate drugs are of the greatest use in the treatment of all forms of rheumatism. The affected joints should be rubbed with gualtherium or some such ointment and should be kept wrapped up in cotton-wool. The bowels must be kept open with calomel at night and salts in the morning. The diet must be bland and fluid until the fever subsides. Later on it will have to be increased very gradually to semi-solids. Leave meat out entirely until the patient is well recovered. A long convalescence will be required, which, since it must take the form of almost complete rest, is easier to obtain at a convalescent home. The danger in all cases of rheumatic fever is that the heart rarely escapes damage in some degree or other unless the greatest care is taken and there is very prolonged rest. Other complications which occur are St. Vitus's dance and cerebral rheumatism, in which there is a very high temperature.

Chronic Rheumatism.—Chronic rheumatism or ordinary rheumatism is a very common disease in the British Isles, and causes a great deal of pain and disability. It is, as its name points out, chronic or long-lasting and difficult to remove. The temperature may be slightly raised and there is a great deal of stiffness in the joints, but the condition generally responds very quickly to treatment by heat and salicylate of soda. Bluish-red swellings sometimes make their appearance in long-standing cases, especially on the front of the legs. (*See also* BATHS.)

Muscular Rheumatism.—This form of rheumatism usually attacks middle-aged people and it is very common among out-

door workers who have to face all weathers. It may be caused by certain poisons developed within the system owing to septic tonsils or decayed teeth. Another source of infection occurs in the bowels of those who are subject to chronic constipation. The symptoms are pain and stiffness in the joints and they are increased by changes in the weather or by changes in the temperature of the body. Warm clothing should always be worn during cold weather and damp clothes must be changed immediately. Muscular rheumatism is also known as fibrositis, or myalgia, and when it occurs in the side it is known as pleurodynia; lumbago is muscular rheumatism in the small of the back or loins, and torticolis is the term used when it occurs in the neck. (*See also* FIBROSITIS; LUMBAGO.)

RHEUMATOID ARTHRITIS is a disease of the joints which occurs in two quite different forms. The one form is particularly common in women during the child-bearing period of life and the cause of the condition is quite unknown, although measures which are effective in other forms of arthritis sometimes relieve, though they seldom cure, this particular one. Because the cause of this form of rheumatoid arthritis is unknown, it is called "primary" rheumatoid arthritis, to distinguish it from the other form, which occurs with equal frequency in men and women; the other form is due to long-continued infection, and is therefore called "secondary" rheumatoid arthritis.

"Primary" rheumatoid arthritis may begin by attacks of cramp or weakness in the muscles of the hand, or the hands may become unnaturally cold in mild weather. Sometimes the onset may be acute, with a rise of temperature, accompanied by a swelling of the joints of the fingers. It is characteristic of this form of rheumatoid arthritis that the muscles and joints of the fingers are first, and most severely affected. Both sides are attacked and gradually the disease spreads to the wrist joints, so that the wrists become very stiff. Wasting of the muscles of the hands is very marked, and in advanced stages, not only are the wrists and fingers stiff, but the hands become deformed, the fingers being drawn up, and the whole hand twisted towards the little finger. In association with the changes in the joints, the patient's general health declines, and such symptoms as anæmia, palpitation of the heart with a quick pulse, sweating, and extreme coldness of the hands and feet may arise. It was thought at one time that infection from such places as the teeth, tonsils, or air-sinuses of the nose was responsible for this form of arthritis, but in a very large number of cases no such infection could be found. If in any particular case, of course, such infection is present, it must be dealt with.

Treatment.—To secure any improvement, the general health must be kept at a high level, and so the patient must be prepared for a long course of treatment. First, any unnecessary mental and physical strain must be avoided. The diet must be a generous one, with plenty of fresh fruit and vegetables; it is not necessary to avoid meat. General tonics such as arsenic, iron and cod-liver oil, are often of benefit. Iodine and thyroid extract are often valuable in certain cases, but the response to these drugs is rapid if they are going to be of any value, and of course, they must only be taken under medical advice. Massage is useful to the affected joints; these joints should be gently moved each day and supported in the best position for recovery by light splints, if necessary. Moist heat, in the form of mud packs or steam, is often very comforting to the patients, and may be of value. The treatment of this condition requires great patience; progress is always slow, and a return of the trouble must be expected if the general health is allowed to suffer.

"Secondary" rheumatoid arthritis may come on either acutely, with a high temperature, when it may be mistaken for rheumatic fever, or it may arise fairly rapidly without any signs of fever. The disease attacks both large and small joints, the fingers, wrists, elbows, toes, ankles and knees, being commonly attacked on both sides of the body. The usual signs of inflammation of a joint are present: the affected joints are swollen, "doughy" to the touch, tender on pressure, and very painful when moved. The muscles just above and below the affected joints are wasted. Sweating of the hands and feet, a feeble circulation leading to coldness of the limbs, and anæmia are common. It is in this type of arthritis above all that infection plays a large part in causing the condition and if the infection can

be traced and dealt with before changes in the joints have gone too far for the joints to regain their proper positions and power of movement, there is every chance of a complete cure. It has already been mentioned that the teeth, the tonsils and the air sinuses connected with the nose are sources of this infection. The infection is caused by germs which manufacture poisons which circulate in the blood and act on the tissues of the joints. Another very important place from which infection may spread into the blood is the lower bowel, and it is rare to find a severe case of "secondary" rheumatoid arthritis in which a history of long-standing constipation is not obtained.

Treatment.—This is first, removal of the infection when this is traced. Next comes the building up of the general health by means of fresh air, sunshine, and a suitable diet, which need not exclude red meat. Vaccines are sometimes of great help in clearing up the infection. Light massage to the joints and the application of heat, either dry or moist, is advisable. Where many joints are affected, baths of a certain type and of high temperature are often given. After the swelling of the joints has gone down, movement at the affected joints must be encouraged. (*See also* BATHS; RHEUMATISM, ACUTE; VACCINES.)

RHINITIS.—This is the medical name for inflammation of the mucous membrane of the nose such as is found in the common cold. It shows itself as catarrh. (*See also* NASAL CATARRH; NOSE.)

RHINOPLASTY.—This means the surgical repair or alteration of the nose. When a nose is very much deformed for any reason, it may be repaired in various ways such as by the grafting of skin or cartilage from another part of the body, or by injecting paraffin under the skin of the nose to fill it out. (*See also* NOSE.)

RHINOSCOPY.—An instrument through which the inside of the nose can be seen is called a rhinoscope. Using such an instrument is called rhinoscopy.

RHONCHI.—This is a name used for the harsh wheezing sounds made by a person who is suffering from bronchitis. These sounds are heard through the stethoscope, or by applying the ear closely to the chest.

RHUBARB.—The powder obtained from various forms of rhubarb stem or root has long been in use as a digestive agent and a purgative. For use in cases of indigestion it is usually made up with some such substances as bicarbonate, of soda, bismuth, cinnamon, etc. Gregory's Powder is a favourite way of taking it. It has a stimulating action on the workings of the digestive system and increases the flow of bile. As a purgative it is often followed by slight constipation which makes it especially valuable in the treatment of some forms of diarrhœa.

RHUS.—This is the generic name for plants of the sumach family which are sometimes used as tonics; they also increase the flow of urine. Rhus Toxicodendron is the scientific name for poison oak or poison ivy which in some people produces urticaria, with itching, burning, and rash as symptoms. The skin should be bathed in solution of permanganate of potassium or calamine lotion.

RIBS are curved bones which enclose the chest cavity and serve to protect the heart and lungs from injury. There are twelve pairs of ribs, of which the upper seven are directly attached to the breast bone (or sternum) in front. These are called the true ribs. Of the remaining lower five pairs of ribs, each of the upper three is attached in front, not to the breast bone, but to the most forward part of the rib above it, the part which is called the costal cartilage, as it is not made of bone, but of a softer material, gristle. The lowermost two ribs are not attached to other ribs in front; their most forward parts lie free, and these last two ribs are therefore called floating ribs. Behind, the ribs are all attached to the back part of the spinal column (back-bone). They are so attached by means of two joints that the ribs are able to turn on the spine, making a movement rather like that of a handle of a bucket. At some distance from the junction of the ribs with the spinal column, each rib, with the exception of the last two, has a bend in it, this bend being called the angle of the rib. The spaces between the ribs are called the intercostal spaces (inter- between, costa- a rib), and these spaces are filled in by muscles, some of which run downwards and forwards, and others of which run downwards and backwards. The muscles which run downwards and forwards raise the rib just below; those which run downwards and

backwards pull the rib above immediately downwards. Along the lower border of each rib, on its inner side, is a groove, in which run the blood-vessels and nerves which supply the muscles of the intercostal spaces.

Fracture of a rib is a very common accident. "A broken rib" is often taken very lightly, but if the broken piece is forced inwards instead of outwards, as unfortunately so often happens, then the injury may be very serious. A broken rib is more frequently the result of crushing of the chest, as when a vehicle runs over the body, than the result of a blow. The fracture usually occurs at the angle of the rib, and the broken pieces are displaced outwards. There may be little or no discomfort from such an injury except pain on breathing.

Treatment.—Where there is outward displacement of the broken ends of the bone, is to strap the chest with strapping-plaster well above and below the broken rib, so that the plaster overlaps. As a rule, a broken rib heals very quickly and the victim of such an accident soon forgets his injury. But if the broken ends of the bone are displaced inwards, as sometimes happens when the fracture is the result of a direct blow on the chest, then there is a great danger that, unless carefully watched for, any sudden movement on the part of the patient may drive the broken ends of bone into the lung or into the covering to the lung—the pleura. If this happens, not only will the patient cough up blood from damage to the tissues of the lung, but there is also the danger of infection reaching the lung from the skin covering the chest wall if this has been torn by the blow causing the fracture. The first-aid treatment of fractures of the ribs is described under the heading of FRACTURES.

RICE WATER.—*See* the SPECIAL SUPPLEMENT ON DIET AND INVALID COOKERY.

RICKETS is a disease of growing children and infants which occurs most commonly between the ninth month and third year. It is very seldom seen in its early stage after the age of three years. The disease is due to a lack of a certain substance known as Vitamin D, either because this substance is not being supplied in sufficient amount in the diet, or because it is not being manufactured by the child in its body. Vitamin D is present to a large extent in most animal fats. It is abundant in normal human milk, but is most abundant in cod-liver oil. In the body, this vitamin is formed in the skin when certain rays of light (known as ultraviolet rays which are found both in natural and artificial sunlight) act upon the skin. It is important to remember that the beneficial action of these rays is prevented unless they have free access to the skin; that is to say, these rays cannot penetrate clothing or ordinary window glass. Rickets is usually seen in those children who are fed on artificial foods which contain a lot of sugar and starch, but which do not contain sufficient animal fat to provide the necessary Vitamin D. When, in addition, these unfortunate children are deprived of what sunlight they might enjoy by unsuitably heavy clothing, the onset of the disease is almost certain.

Symptoms.—The first signs to make their appearance are restlessness, sweating of the head, especially during sleep, and irritability. The child's appetite becomes poor and it is either constipated or has bouts of diarrhœa. The child is commonly fat and flabby, and the abdomen sticks out, giving a "pot-bellied" appearance. Teething is delayed. The most striking evidence of the disease is given by the changes in the bones. These are softer than normal, due to the formation of an abnormal type of bony tissue which has fewer lime salts in it than it should have. Because the bones are softer than normal, they bend more easily when any strain is put upon them, which explains why a child with rickets who is allowed to walk, or to sit with its legs tucked under it, gets deformities of the legs, such as bow-legs or knock-knees. If the child rests much weight on the arms, these may also become bent. The spine may develop a hump and the walls of the chest become flattened. Rows of enlarged softened bone appear down each side of the chest in front, forming what is called a "rickety rosary" and the skull increases in size, producing a square, broad forehead.

The muscles in rickets are flabby and the whole appearance of the child is one of fatness and limpness. Owing to the bending of the bones of the legs, walking is difficult and will be late. Apart from the deformities associated with the changes in the bones, children with rickets are in danger of suffering from chest troubles. These are exceedingly common amongst rickety children, and

broncho-pneumonia or bronchitis is responsible for the death of most of these children. Convulsions are also a source of danger, though they are not often fatal in themselves. A peculiar spasm of the throat which almost chokes the child may occur in rickets. This is known as laryngismus stridulus and is a frightening sight to watch. The child catches its breath, and makes a crowing sound, which is particularly noticeable when the child cries. Just as it goes blue in the face, it will breathe out, and the spasm will relax. A hot bath is the first-aid treatment for this condition, and also for the general convulsions which may occur during the course of the disease.

Treatment.—*This may be summed up in one word: Prevention. No child should ever be allowed to get rickets.* In breast-fed children there is little chance of the condition developing if the child is weaned at the proper time, but in artificially-fed children it is wise to give cod-liver or halibut oil from the third month. Amounts of 5 drops should be given twice daily to start with and the dose should be gradually increased, so that by the ninth month the child is receiving two teaspoonfuls daily. In addition, the child should have as much natural sunlight as possible, and the minimum of clothes which will keep the infant warm should be put on. If the disease has already developed large doses of cod-liver oil, or better still calciferol or one of the new preparations of Vitamin D should be given, and the child should be exposed to artificial ultra-violet light. It should not be allowed to walk or crawl until the bones are strong enough to bear its weight, and to prevent its doing so it may be advisable to attach long, light splints to either side of the body and to the limbs. Gentle massage is useful for toning up the flabby muscles. Great patience is needed to overcome such deformities as knock-knees, bow-legs or humped back if these have been allowed to develop. As a general rule, with correct treatment by diet and Vitamin D, these deformities disappear; but in some instances it may be necessary to call in the aid of surgery.

RIGIDITY means stiffness, and the term is applied either to a condition of a joint, or to muscles. In a joint, this stiffness may be due to disease of the joint which has caused the bones taking part in the joint to unite, so that no movement is possible; or the muscles surrounding the joint may be in a condition of spasm to prevent a painful joint from being moved. The same spasm of muscles occurs in the muscles of the abdomen, when there is inflammation inside the abdomen. This rigidity is very valuable to the doctor as it helps him in his diagnosis. In certain diseases of the nervous system, such as hemiplegia, there is rigidity of the muscles of the limbs. This form of rigidity is due to an increase in the tone of the muscles. (*See also* JOINTS.)

RIGOR is a sudden severe shivering fit which occurs in certain fevers, particularly in malaria, and may occur at the commencement of an attack of pneumonia or septicæmia. The patient first looks blue in the face and has a pinched expression. He then begins to shiver, and the movements are so violent that he may shake the bed and his teeth may chatter. The rigor may last from a few minutes up to an hour or so, after which the patient feels warm again. Although the patient feels cold, yet the temperature is actually above normal. It is essential that during the rigor the patient should be kept warm. This may be accomplished by the use of extra blankets, hot-water bottles, and by giving the patient hot drinks, such as hot lemonade. In a child rigors are not common. At the beginning of a severe fever a child is more likely to have a general convulsion than a rigor.

RIGOR MORTIS is a stiffening of the muscles which occurs after death and is due to chemical changes in the composition of the muscles when blood ceases to flow through them. The degree of rigor mortis varies according to the time a person has been dead, and after allowing for certain errors it is possible for a doctor to estimate to within a few hours how long death has been present.

RINGWORM.—Ringworm is a skin disease caused by a fungus. It attacks any part of the skin, and its manifestations vary greatly in different areas.

Ringworm of the *scalp*. In the adult this is exceedingly rare; most of the cases occurring between 5 and 12, and, even if untreated, tend to die out at puberty. One or more rounded spots, partially bald, are seen, in which the remaining hairs are short, dull, and twisted. The diseased spots are scaly, and often outlined with a reddish ring. The

fungus can be seen in the hairs (and skin scrapings) under the microscope.

Ringworm of the *beard* appears in two forms: (1) As ringworm of the body; (2) resembling barber's itch. The affected parts are swollen, painful, and nodular.

Ringworm of the *body*. Here the "rings" to which the disease owes its name are chiefly seen. The patches are red and scaly. These cases spread rapidly, especially in the armpits and the groins, where heat and moisture are present. Ringworm of the groins is common in hot countries, where it is called Dhobie's itch, craw-craw, etc.

Ringworm of the *palms*, *soles*, and *nails*. This is far from uncommon. On the palms are found two forms: (1) The acute, which resembles an acute dermatitis; (2) the chronic, where the palm is dry, scaly, and slightly reddened. So little inconvenience is caused that the patient may go on for years without treatment. The soles may be similarly affected, but in the commonest form the skin between the toes is white and sodden, peels off in large flakes, and leaves an oozing red surface. Cracks at the base of the toes are common, and itching is troublesome. The nails have a dirty, yellowish, "eaten-away" appearance which is very suggestive. All these cases are very difficult to diagnose unless scrapings from the skin are examined microscopically.

The *outlook* in ringworm depends on various factors. If ringworm of the scalp is untreated, it lasts till the child reaches puberty. Otherwise, 8 months at least is considered necessary for a cure. Ringworm of the nails requires very persevering treatment, and the time taken to cure it on the palms and soles varies with its thoroughness. Ringworm of the beard takes 6–8 weeks to cure, and that of the non-hairy skin 6–10 days.

Treatment is far from easy. It is simple enough to destroy the ringworm fungus itself; the difficulty in practice is to destroy the fungus without affecting the patient.

Ringworm of the *scalp* is treated by shaving the head, washing daily, and thorough rubbing in of an antiseptic ointment. Care is taken in using brushes, towels, caps, etc., and the affected child must sleep alone. Other children should always be carefully examined for traces of the disease. X-rays, in expert hands, is one of the best and quickest methods, thousands of cases being treated successfully every year. The method is to expose the scalp to carefully estimated "doses" of the rays. After 2–3 weeks, the hair comes out entirely. Then the scalp is treated regularly with antiseptic ointment until clear. New hair appears in 6–8 weeks, and is fully grown in 3–4 months.

Ringworm of the *beard* is treated by removing the hairs with forceps and thoroughly rubbing in an antiseptic ointment.

Ringworm of the *body* is easily cured by antiseptic ointment. If the groins and armpits are affected, soothing remedies, such as boric ointment, are applied as preliminary treatment.

Ringworm of the *palms* and *soles* is treated by antiseptics; a good plan is to have a daily 10 minutes' soak with dilute Condy's fluid, and then apply antiseptic ointment.

Ringworm of the *nails* is by far the most obstinate of all forms. If untreated it remains for life. The best method is to apply a solution which softens the nails, such as Fehling's solution, so that they can be removed without pain. Antiseptic treatment is then applied to the nail-bed until no trace of the fungus remains.

RODENT ULCER (Latin *rodens*, gnawing) is a surface cancer of the skin where the ulceration is the chief feature. It should be noted that the disease has lasted some time before it becomes either "rodent" or an "ulcer." It commences in the ordinary way as a small hard nodule in the skin, and, as it grows, stretches the skin over it until a raised, "mother-of-pearl," shiny area appears. It is very constant to certain situations, 95 per cent. occurring on the face, and of these about 46 per cent. on the side of the nose where it joins the cheek, a little higher than the middle, and about 24 per cent. at the outer corner of the eye. Only very rarely does it occur on other parts of the body. It is equally frequent in men and women.

It remains at the nodular stage for years, and, until it grows, may be undistinguishable from a non-pigmented mole. (Non-pigmented here means lacking the brown colour commonly seen in moles.) No pain is felt, though the patient may complain of itching; pain, indeed, is rarely felt even in bad cases, though the itching increases with the growth of the ulcer. When it begins to grow, the sides extend and the centre sinks, "it is like a lake surrounded on all sides by hills."

Soon the centre breaks down and ulcerates, but the discharge is generally very small; the ulcer also spreads towards the margins, and may heal by scarring at the centre. Finally the whole of the surface sloughs or comes away, except the rolled edge, and the typical *rodent ulcer*, as it is usually first seen by the doctor, has formed.

If untreated, or, worse still, if treated by quack medicines, the disease attacks and destroys every structure with which it comes in contact, such as the eyelids, the walls of the nose, and the bones of the face, leading to the most hideous deformities, and finally to the death of the patient from hæmorrhage, erysipelas, meningitis (inflammation of the coverings of the brain), or exhaustion. Fortunately people are becoming more sensible about seeking early treatment, and such cases as these are seldom seen nowadays.

Secondary growths in the lymph glands, though not unknown, are extremely rare.

The disease usually occurs in middle and old age, though many cases are known of much younger patients. This may sometimes cause difficulty, as lupus (tuberculosis of the skin), which usually occurs in youth, though again not always, may closely resemble rodent ulcer. Lupus, however, may be distinguished by the tuberculin test. (*See* LUPUS.) A syphilitic ulcer sometimes resembles rodent ulcer, but grows as much in a week or two as a rodent ulcer in a year. Itching, which rodent ulcer patients generally complain of, is never present in syphilis.

Treatment.—The outlook for untreated or maltreated cases, as already stated, is almost hopeless, but if patients are seen early and correctly treated, it is safe to say that in 100 per cent. of the cases a cure is certain. Treatment varies a little with the stage at which the patient is first seen. In the early stages, when it is possible to remove the growth completely, this is done by curetting, or scraping with an instrument known as a "sharp spoon." The curetting is done very thoroughly, to remove every part of the ulcer, and when the bleeding has ceased it is dressed with fused chromic acid. A scab forms, which remains on for about a fortnight, and when it comes away the wound underneath is generally entirely healed. The scar is smooth, and it is remarkable, considering the thorough treatment, how small and insignificant a mark remains on the skin.

A small growth may also be "frozen" by the application of carbon dioxide snow, a very simple and rapid method, causing comparatively slight pain. It is not, however, considered to be quite as certain as some of the other methods, though in many cases it has given excellent results.

Caustics, such as salicylic acid, chromic acid, pyrogallol, resorcin, and arsenious acid, the last being the best, are also frequently used. These mentioned have what is called a "selective action," that is, they cause more destruction to the tissues of the rodent ulcer than to the healthy skin around. Milder caustics, such as silver nitrate, are not now used, as it is found that they merely annoy the growth and increase its activity. This caustic method is very satisfactory in skilled hands, but is at first very painful. One of the newer methods, which seems to be giving good results, especially in early cases, is the painting once weekly with a 10 per cent. solution of potassium bichromate in water. It appears to act as a slow caustic. In this and the more severe methods a scab is formed, and, when this falls off, a healthy healing surface is seen.

The most satisfactory method, however, especially in the early stages, is radium. About a fortnight after the "exposure," as the treatment is termed, there is a great reaction, as with the caustics, and a scab forms over the ulcer. This separates after about two or three weeks, the ulcer is found to have disappeared, and the part is usually quite healed.

X-rays are next in value, especially in neglected and widespread cases. After treatment, it is first noticed that the ulcer becomes dry, the itching disappears, and the patient says that he feels much more comfortable. In about a week, new skin is seen over the surface of the ulcer, which is at the same time filling up with healthy tissue from the bottom. Several applications may be required of both radium and X-rays, but the results are in general so good that treatment should be persevered with. A very flat, smooth scar is left in place of the ulcer, and there is practically no disfigurement.

During the exposure to the X-rays or radium, the surrounding tissues are protected by some substance which does not allow the rays to pass, such as lead or rubber. In treating the eyelid, for instance, a sheet of lead, rubber, or lead in rubber tissue, is

moulded to the shape of the eyeball and placed under the lid, so that no harm can come to the eye.

Unfortunately, however, the X-rays have no effect on bone or cartilage, so that when these are affected there is little hope of a cure. If possible, the diseased bone or cartilage is removed and the X-rays applied to the raw surface; but generally in these cases the mischief is too widespread for any treatment to produce a cure.

ROMBERGISM.—This is a term applied to the inability to stand without falling over, when the eyes are shut. It is found as a symptom in some diseases of the nervous system, especially in locomotor ataxia.

RÖNTGEN RAYS.—This is another name for X-rays, from the name of their discoverer.

ROSACEA.—A form of skin disease. (*See also* Acne Rosacea.)

ROSEMARY.—The rosemary plant gives us an oil which is used as a stimulant to the skin and which is often included in hair tonics. (*See also* Oils.)

ROSEOLA.—This is a term applied to any rose-coloured rash. (*See also* Erythema.)

ROSIN.—The residue left after distilling off the volatile oil from turpentine. (*See also* Resin.)

ROUND LIGAMENT.—A flat cord-like ligament that attaches the womb to the groin on each side of the body is called the round ligament. This term is also applied to a ligament of the liver, which is in reality a closed blood-vessel. It is the umbilical vein which before birth carries blood from the mother to the child. (*See also* Cord.)

RUBEFACIENT.—A rubefacient is the name given to any drug that produces tingling of the skin and dilatation of the blood-vessels. (*See also* Counter-Irritation.)

RUBELLA.—This is another name for German Measles.

RUPIA.—This term is used to describe an eruption of the skin in which large dirty-brown scabs, which present the appearance of an oyster shell, are found on the skin. The condition is one of the complications of syphilis. (*See also* Syphilis.)

RUPTURE.—Rupture, or hernia, usually refers to the protrusion of part of the intestine or abdominal contents through the abdominal wall. The weak places where ruptures are liable to occur are at the navel or in its immediate neighbourhood (umbilical rupture), or in the groin (inguinal or femoral rupture). The chief surgical authorities assert that a rupture is always due to a congenital weakness in the wall of the abdomen, and that exertion or accident never play a really important part in the production of a rupture.

The weak places are, however, stretched as a result of manual labour, such as the lifting of heavy weights, constant straining due to a stricture, chronic constipation, or repeated pregnancies. A rupture may occur at the site of an operation where the fibrous tissues are subjected to more strain than they can stand without stretching.

A hernia will be felt as a bulge in the abdominal wall, which is more noticeable when the patient strains in any way, as in coughing. If the swelling can be pushed back into the abdominal cavity, the hernia is said to be reducible; if the mass will not return, the hernia is irreducible, and if the circulation in the contents of the hernia becomes interfered with, it becomes strangulated. If a strangulated hernia cannot be reduced, immediate operation is necessary in order to prevent that portion of the bowel from becoming dead or gangrenous. The symptoms are acute pain, violent vomiting and intestinal obstruction.

In children, the commonest form of hernia is the umbilical. It is due rather to a retarded development than to a definite weakness, and it is treated by a truss such as can be conveniently prepared at home. A flat disk, such as a penny, is strapped over the swelling and kept there night and day, with replacements only for the sake of cleanliness, until the muscles have fully developed and the weak area has disappeared.

Inguinal hernias (ruptures in the groin) are rather more common in boys owing to difficulty in passing water through a tight foreskin. The rupture is usually easily reducible by placing the child on his back and pressing gently on the swelling, at the same time supporting the edges of the opening with the other hand. If the protrusion keeps returning, operative treatment must be considered, or a properly fitting truss must be worn all the time. (*See also* Abdominal Belt; Hernia.)

RUSSIAN BATH.—Treatment in which the whole body is exposed to hot steam is known as a Russian Bath. (*See also* Baths.)

SACCHARIN.—Saccharin is an intensely sweet crystalline powder derived from toluol (methyl-benzol). It is chiefly employed as a sweetening substance, especially in cases of diabetes and obesity when sugar cannot be taken. Tablets of varying strengths can be obtained with the sweetening power of the saccharin between 300 to 500 times sweeter than sugar. (*See also* SUGAR.)

SACRUM.—The lower part of the spinal column is composed of five vertebræ which join together to form a massive bone known as the sacrum. or sacred bone. This bone lies between the two haunch-bones, and it forms the back wall of the pelvis, and in consequence, is slightly wider in women than in men. (*See also* PELVIS.)

SAFFRON.—Saffron, or crocus, gives us a colouring matter which has been used from the earliest times as a dye. Oil of saffron has a peculiar aromatic odour and a sharp, bitter taste. At one time it was credited with many beneficial medicinal properties, particularly as regards bringing out the spots in cases of measles. (*See also* OIL.)

ST. ANTHONY'S FIRE.—This term was used during the Middle Ages for the disease now known as erysipelas. (*See also* ERYSIPELAS.)

ST. VITUS'S DANCE is a disease chiefly of children between the ages of five and fifteen years, and it occurs more often in girls than in boys. Although the actual disease itself may get perfectly well, yet as far as its results are concerned it is one of the most crippling of all the diseases of childhood. If only one attack of St. Vitus's dance occurs, it is likely, to say the least of it, that the heart will be damaged unless extreme care and caution are taken to give the child the necessary rest; but if more than one attack is suffered, then the heart will almost certainly become diseased. This is because St. Vitus's dance, or to give it its medical name, **Chorea,** is one of the more severe forms of that scourge of childhood, rheumatism. Every child who has had even a slight attack of chorea is a candidate for rheumatic heart disease unless every precaution is taken against it. For this reason it is of supreme importance that St. Vitus's dance should be recognized in its early stages and treated rightly.

The name "St. Vitus's dance" was given to the condition chorea because of the curious movements which the children who suffer from it make. These movements are spasmlike, quite outside the control of the will and very irregular. They occur more commonly in the arms and hands, and the feature of them is, that the same movement is never repeated continuously, as it is in the movements due to silly habits. The movements vary in degree: in one child they may be so severe that the child falls out of bed and hurts itself; they may only be shown up by getting the child to hold its hands out in front of it and separate the fingers, when the jerking movements will be seen. Sometimes these jerking movements cause the child to be accused of carelessness in behaviour, for a cup or spoon which is being held in the hand may suddenly fly out of the hand owing to a jerking movement. Continued apparent clumsiness in a child of school age should always arouse the suspicion of St. Vitus's dance. Grimaces and jerking movements of the tongue are common, and often such unfortunate children are told "not to pull faces."

Although the movements are the most striking symptoms of chorea, yet, as has already been said, these may be very slight, although the child may be suffering from a severe attack of the disorder. In a considerable number of cases, the most obvious sign to the parents is a weakness or apparent paralysis of one arm or leg. This may be so pronounced that the child is taken to the doctor as a case of paralysis. The limb is not, however, truly paralysed; the child is only unwilling and disinclined to use it because it is difficult to use it properly. The other important symptom of chorea is the mental change. A child with chorea becomes nervous, rather inclined to cry easily. and often silent. Although the victims of chorea are usually the clever, bright children, during the attack they become dull, are unable to give their attention to their lessons and they may suffer from sleeplessness. In a few cases, there is fever, with delirium. During an attack signs of heart trouble may appear in the form of alteration in the sounds of the heart as heard by the stethoscope.

Treatment.—There are three main lines of treatment in chorea, but only one is of real

importance and that is, rest, mental and physical. From what has already been said it will be realized that the main fear in chorea is that the rheumatic agent, whatever it may be, will attack the heart. Rest in bed, alone in a room, or at least behind a screen, is the only treatment that matters. The child must be kept in bed until all movements have ceased for at least a week, and until the doctor is satisfied that no further damage can be done to the heart by the attack the child has passed through. In very severe cases in which the movements are so violent that the child is in danger of hurting itself in an ordinary bed, either a padded bed is required or mattresses can be placed on the floor and protected from draughts by careful screening. The diet must be light but very nourishing, and for a time it may be necessary to give a liquid diet if the child has difficulty in swallowing ordinary food. An unbreakable feeding-cup is sometimes better when the movements of the jaws and face are very bad. Milk and cod-liver oil are good for these children, and may be given in large quantities.

When sleeplessness is very pronounced it may be necessary to give drugs to induce sleep. For the disease itself many different drugs are prescribed, of which arsenic and iron and aspirin are the most in favour. Recently the induction of a high temperature by injecting a serum has been recommended, but this method of treating chorea is still on trial. The one treatment which no drug can replace is rest in bed. It is usually easy to get these children to stay in bed as they feel the movements less whilst lying down, and for the first few days at least, no visitors should be allowed and as little excitement as possible in the way of reading or occupying the hands with handiwork.

Chorea may show itself in its most severe form either at the beginning of adolescence or during pregnancy. During these times of stress, the movements may be exceedingly violent and the mental changes may be so severe as to lead to the necessity for temporary institutional care. But with the recovery from the attack of chorea, the mind regains its normal state.

One variety of St. Vitus's dance occurs in the aged. It has no real relation to the ordinary rheumatic chorea such as has been described, but the movements somewhat resemble those of that disorder, so it has been named **Huntingdon's Chorea,** after the discoverer. Huntingdon's chorea runs in families and can often be traced through several generations. Both sexes suffer in about the same proportion. The symptoms consist of movements like those of ordinary chorea, together with difficulty in walking and gradual mental deterioration to complete dementia. The movements are generally a little slower than those of the rheumatic chorea; but, like them, they cease during sleep. The difficulty in walking shows itself as a staggering, rather like that of a drunken man. The disease begins well after middle life, and often lasts a number of years. It is due to a degeneration of the nerve cells in a particular part of the brain. There is no known cause for this; it just happens in certain families. There is little that can be done for the sufferers from this disease. When mental changes become pronounced it is kinder to the patients to allow them to end their days in a mental hospital instead of at home, owing to the amount of skilled nursing required. (*See also* DELIRIUM; DEMENTIA.)

SAL ALEMBROTH, or as it is more commonly termed, alembroth, is an antiseptic which is used in surgery as a dressing. It is chemically a compound of mercury and ammonium chlorides and its main use is in an antiseptic gauze which is impregnated with the chemical.

SAL AMMONIAC is the common name of ammonium chloride.

SALICIN is a bitter tonic which is obtained from the bark of the willow and the poplar. It is much used in the treatment of rheumatism and, like quinine, in neuralgia and the common cold. In the body, salicin is altered chemically and becomes salicylic acid, to which fact its actions are due.

SALICYLATE is a chemical compound called a salt of salicylic acid. The salicylates are much used in the treatment of rheumatism both internally and externally. The one most used as a medicine is sodium salicylate, whilst methyl salicylate or oil of wintergreen has a great reputation for its effect on rheumatic joints when used as an external application. (*See also* SALT.)

SALICYLIC ACID is a colourless crystalline acid which is found in Nature in wintergreen and in the sweet birch tree. but it is

now more cheaply prepared from carbolic acid, a product of coal tar. Salicylic acid has many uses in medicine as it has the property of reducing fever and is also an antiseptic, prohibiting the growth of germs. It is given internally in acute rheumatism and rheumatic fever, and also in sciatica and certain forms of neuralgia. For its antiseptic properties it is used in skin diseases, and because it assists in dissolving off the outermost thickened layers of the skin it forms the chief ingredient in many corn cures.

Sometimes in rheumatic disease in which a large amount of salicylic acid or the salicylates have been given, symptoms of poisoning occur. These show themselves by noises in the head, deafness, dimness of vision, vomiting and delirium. Any of these symptoms arising in a person who is taking salicylic acid must be brought to the notice of the doctor. (*See also* RHEUMATISM.)

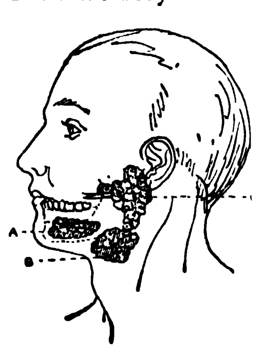
SALINE means "salty," and is correctly used when speaking of a solution of common salt. However, such common purgatives as Glauber's salts and Epsom salts are usually described as salines. (*See also* NORMAL SALINE, under NORMAL.)

SALISBURY DIET consists of meat and hot water only. The meat, of which from two to three pounds are allowed daily, is minced and only lightly cooked, being served in little cakes to make it more appetizing. Four to five pints of hot water are taken daily, a pint an hour before each meal and the same quantity half an hour before bedtime. This diet is continued for a period of from two to three months. It is prescribed for the treatment of obesity, some skin conditions, such as psoriasis, and in certain cases of bowel trouble in which starchy foods cause much gas formation and cannot be digested. This diet must not be taken unless the kidneys are working properly, and an examination of the urine is essential before such a diet is started. (*See also* DIET AND INVALID COOKERY.)

SALIVA or spittle is a somewhat sticky, cloudy liquid and consists mainly of the products of the activity of the salivary glands in the mouth, but may also contain mucus, and cells which are shed by the lining of the mouth. The saliva serves to moisten and soften the food, and by dissolving substances in the mouth it assists the function of taste. It contains a ferment called ptyalin, which alters the indigestible starchy foods so that they are ready to be digested by the ferments in the stomach. Therefore, by bolting a meal the stomach is given more work to do as the first stages in digestion have not been carried out by the saliva.

In some conditions there is a great increase in the amount of saliva. This occurs after large and frequent doses of mercury and is one of the earliest symptoms of mercury poisoning. A disease in which there is much misery caused the patient by increase in the amount of saliva, is sleepy sickness. Fortunately, this excessive salivation, as it is called, can be controlled by large doses of belladonna, which stop the production of saliva and cause dryness of the mouth. In some cases of debility it is desirable to increase the flow of saliva, and for this purpose mustard or small doses of pilocarpine are employed. Such drugs which increase the amount of saliva are called sialagogues.

SALIVARY GLANDS are those glands which produce the saliva. There are three pairs of these glands: the parotid, which lies in the cheek, just in front of, and below the ear; the submaxillary, which is placed just below the body of the lower jaw; and the sublingual, which lies in the floor of the mouth, underneath the front part of the tongue. All these glands produce saliva which contains the ferment, ptyalin, which changes starch into a sugar, but the saliva produced by the submaxillary and sublingual glands is thick and sticky, whilst that from the parotid gland is thin and watery. There are several disorders of the salivary glands, of which the most uncomfortable for the patient is the formation of small stones in the glands. This happens only in the submaxillary and sublingual glands, and the pain caused by the movement of the stones



Salivary Glands: A—Sublingual; B—Maxillary; C—Parotid

along the passages or ducts of the glands leading into the mouth is often very distressing, being noticed most particularly when food is taken into the mouth, as the glands then attempt to discharge the saliva along the ducts which are blocked by the stones. Removal of these stones is a simple operation; but their formation may persist, unless the infection of the teeth and gums which is always present is attended to. The parotid gland shares in the general enlargement of the glands due to mumps, and is nearly always the first symptom of that disorder. (*See also* MUMPS; PAROTID GLAND.)

SALOL is a white, crystalline powder, which is almost insoluble in water, but which dissolves readily in chloroform, ether and alcohol. When taken by mouth it is altered chemically in the bowel, carbolic acid and salicylic acid being produced. It is therefore most often used as an internal antiseptic, but is also of service in such conditions as rheumatism and jaundice. (*See also* CARBOLIC ACID; SALICYLIC ACID.)

SALPINGITIS is an inflammation of the tubes which lead from the ovaries to the womb (Fallopian Tubes). It occurs after infection of the womb in childbirth or after an abortion, and is also one of the chief complications of gonorrhœa in women. (For the symptoms of the condition *see also* PERIMETRITIS; GENITAL SYSTEM; GONORRHŒA.)

SALT in chemistry means a combination of an acid with a base. For example, Epsom salt (magnesium sulphate) is a combination of the metal magnesium with sulphuric acid. But, in everyday life, the term "salt" is applied to that combination of sodium and hydrochloric acid which is chemically called sodium chloride.

SALTPETRE is the ordinary name for a salt called in chemistry potassium nitrate.

SALTS mean in popular language saline purgatives. They include Glauber's salt, which is sodium sulphate; Epsom salt, which is magnesium sulphate; Rochelle salt, which is potassium and sodium tartrate; "fruit salts," and others. Salts should be taken on an empty stomach, first thing in the morning, and are especially valuable for biliousness.

SALVARSAN, which is also known as "606," arsenobillon, arsphenamine, arsenobenzol, is a valuable drug which is used in the treatment of syphilis, and in other diseases which are caused by similar coiled germs called spirochætes. It was discovered by Ehrlich early this century, and owes its name "606" to the fact that it was the six hundred and sixth experiment which gave Ehrlich the chemical composition of the drug for which he had been seeking, that is, one which would kill the spirochætes in the living body without being poisonous to the tissues of the body.

Many improvements have since been made upon the original composition, and now preparations called neo-salvarsan, silver salvarsan, and sodium salvarsan are used more than the original compound. The composition of all these preparations is one of a combination of arsenic with some compound of benzol. All of them are produced in powder form, but the powder soon alters on exposure to the air, so each dose is put up by the chemists in separate little glass containers, which are sealed. When required for use, the container is broken and the dose is dissolved in a measured quantity of boiled water, before being injected into a vein. As a rule, a number of injections of salvarsan or one of its compounds are given, and the patient is then given a rest, though he continues to be treated by means of mercury.

After an interval of three to six months, another course of injections is given, and a third course may be required to complete the cure of syphilis. Salvarsan is most effective in the treatment of this disorder when it is given in the early stages of the disease. Once the disease has become generalized, that is, spread into the blood-stream and so into all the organs of the body, a complete cure of the disorder is much more difficult. When the heart and blood-vessels have been damaged by syphilis it is not considered safe to give salvarsan or its compounds. Occasionally the use of salvarsan is followed by severe symptoms of poisoning, such as jaundice, and convulsions, but such an event is so rare as to justify the use of this drug in every early case of syphilis, unless there is some existing disease of the kidneys, liver or blood-vessels. Although salvarsan kills off the majority of the spirochætes which cause the disease, it may not kill all of them, and in the interval between courses of injections, it must be insisted upon that vigorous treatment by mercury is necessary

for the complete treatment of syphilis. *See also* SYPHILIS.)

SAL VOLATILE is ammonium carbonate, or aromatic spirit of ammonia, and it is a favourite remedy for faintness. About fifteen drops drunk in half a wineglassful of water usually serves the purpose. (*See also* AMMONIA.)

SAND BAG is a bag shaped like a small pillow, made of bed-ticking and filled tightly with clean, fine sand. Sand bags are used to support injured limbs or to prevent the weight of the body resting too long on a certain spot in the case of long-continued illness. Such bags are often made with an extra waterproof covering which can be washed with a disinfectant and changed when necessary.

SAND-FLY FEVER is a disease of the tropics which is caused by an unknown germ conveyed by the bite of the sand-fly. It occurs in Egypt and India, but has been recorded from the Mediterranean. The fever comes on suddenly, accompanied by headache and severe pain behind the eyes. The temperature usually reaches its highest level by the end of twenty-four hours and then gradually falls to normal by the end of three days. The disease is not fatal, though convalescence may be a long one. Treatment is mainly directed to the relief of headache, in which aspirin and phenacetin are as effective as most drugs. The disease may occur each year in the season in which sand-flies are most numerous. The sand-fly is so small that it can penetrate the ordinary mosquito net and a specially fine sand-fly net may prove too hot for comfort.

SANITATION is one of the concerns of those responsible for the maintenance of the Public Health. It includes any measure taken to safeguard the health of the community, but more especially refers to measures regarding disposal of refuse and sewage and other sources of possible infection, the provision of public bathing facilities, and the inspection of houses and factories where defective drains are suspected. (*See also* DRAINS; HYGIENE.)

SANTONIN is a drug which is extracted from the dried flower-heads of the plant artemisia maritima. Santonin itself occurs in flat colourless crystals which become yellow when they have been exposed to the air for a short time. It is chiefly used in children to cure round-worms. The drug must be given on an empty stomach and a suitable purgative such as calomel must be given at the same time or just after the santonin. If too large a dose has been given, the child may complain that it "sees things yellow," as santonin has the property of sometimes producing yellow vision. Large doses produce vomiting and convulsions. (*See also* WORMS.)

SAPRÆMIA is a condition in which the poisons or toxins manufactured by germs in some local hiding-place in the body escape into the blood and circulate throughout the body. This condition occurs most commonly in connection with childbirth or a miscarriage, if all the afterbirth or blood clot is not expelled from the womb. If retained there, certain changes take place in the blood clot which go by the name of putrefaction and which are due to germs. Once putrefaction has arisen, the germs multiply rapidly and they manufacture poisons which, as has already been said, escape into the blood-stream. The same kind of changes with the same results may occur in any kind of wound or in any collection of pus in the body. The symptoms of sapræmia are those of a mild septicæmia. The patient becomes feverish, the fever often beginning with a shivering attack, and headache and delirium, especially at night, are common. The tongue is furred, and vomiting and diarrhœa may exhaust the patient's strength. The treatment is that of the source of the infection and once this has been traced and removed, the outlook for complete recovery is good. (*See also* SEPTICÆMIA.)

SARCINA are germs which are widely distributed in Nature but do not cause disease, so far as is known. They are rounded, largish germs, and have the peculiarity that when they multiply they do so in three planes, so that they appear under the microscope clumped together in cubical masses.

SARCOMA is a type of growth which is very malignant. There are at least two important kinds of cancer. One arises from those tissues of the body which in the developing embryo formed the layer of the skin; this kind of cancer is called a carcinoma. The different forms of carcinoma will be found under the heading CARCINOMA. The other important kind of cancer, sarcoma, arises from those tissues which in the embryo formed the connective tissue. that is, the

muscles, and the supporting tissue of the body generally, including the bones. The malignancy of the sarcoma is greater as a rule than that of the carcinoma for two reasons; one is that true sarcomas consist of tissue that would be normal only in the developing embryo; they do not occur after embryonic life, whilst in the carcinoma an adult tissue may merely have "run riot." The second reason why a sarcoma is so much more malignant than a carcinoma is because a sarcoma spreads through the blood-stream, and so the sarcoma cells may be carried throughout the body, whilst a carcinoma rarely spreads by this route, but mainly by the lymphatic stream (*see* LYMPHATICS). Both forms of cancer spread by eating into and destroying the healthy tissues around them; but sarcoma spreads thus more quickly than carcinoma because there is no barrier of connective tissue thrown out against a sarcoma, it is a "relation" of connective tissue so to speak, and therefore meets with no opposition, whilst a carcinoma, having arisen from a different tissue, the skin tissue, is a foreigner, and a protective defence is raised against it in an attempt to stop its progress through the connective tissues.

There are many different types of sarcoma, and these are described according to the shape of the cells of which the tumour is composed. For example, there is the large round-celled type, the small round-celled type, the small spindle-celled type (often referred to as the oat-shaped sarcoma) and the large spindle-celled type. One special type of sarcoma is called the melanotic sarcoma; but there is much discussion as to whether this tumour should not be classed with the carcinomas. Its cells contain a dark colouring matter, melanin, which is found in the retina, in coloured moles, and in the colouring matter of the deep layers of the skin. This type of sarcoma is a very deadly one. Another, much less malignant one, arises in the cells of the bone marrow and is called a myeloid sarcoma.

The cause of formation of a sarcoma is linked up, of course, with that of the problem of the causation of cancer. Experimental work on certain birds has shown that a sarcoma can be passed on from one bird to another indefinitely by injecting an extract of the growth prepared in a certain way. The full significance of this work has yet to be ascertained, but it is undoubtedly along the lines of such experimental work that the secret of how cancer is produced will ultimately be solved.

Symptoms.—A sarcoma may arise in any part of the body and it may spread so rapidly that signs of spread of the growth to other organs may be present before the original growth is recognized. When a sarcoma arises in a place where it can be felt, it usually forms a swelling which, although painless at first, may soon become considerably painful. It is often very difficult to say whether such a growth is a sarcoma or whether it is a comparatively harmless growth, or the result of some inflammation. In such a case, removal of a small portion of the growth and examination under the microscope will decide the question. If left untreated, a sarcoma generally comes to the surface and bursts through the skin, if the patient survives long enough for this to happen. The chief danger to life in sarcoma is involvement of a vital organ by the growth. Spitting up of blood, breathlessness and severe cough should arouse suspicion that the growth has been carried in the blood-stream to the lungs, for example.

Treatment.—If possible, the growth must be removed by operation, and if a limb is affected amputation is necessary to save life. When operation proves impossible, either owing to the situation of the growth or to involvement of other parts of the body, treatment by X-rays or radium must be tried. Coley's Fluid may also be injected. This fluid consists of the bodies of certain dead germs which, when injected, cause a rise of temperature and are said to have a good effect in arresting the growth of a sarcoma. In a few cases good results have been obtained, but general medical opinion is not in favour of the use of this fluid. (*See also* CANCER; CARCINOMA.)

SARSAPARILLA is prepared from the dried root of a plant, and has a great reputation as a purifier of the blood. There is, however, no foundation for this belief, as the drug contains no ingredient which has any medicinal value. Any good effect obtained from the use of sarsaparilla preparations is due to the action of other substances which may be contained in them.

SASSAFRAS is the dried brown root of a tree which is found in North America. This

root has valuable properties: it contains substances which promote sweating, and it is a gentle stimulant to the bowel muscle. From the root an aromatic oil is obtained, known as oil of sassafras, which is used sometimes in perfumery, but more often for the less pleasant purpose of destroying head-lice.

SCAB is a crust which is formed over an ulcer or wound. It is composed mainly of blood-clot, clotted lymph, or pus. It is difficult for healing to occur under a scab, and usually this has to be removed in order to allow healing to take place. Scabs may be softened and removed by soaking the part with a hot solution of bicarbonate of soda, or by means of a poultice composed of boracic acid or starch.

SCABIES.—Scabies, or the itch, is a disease of the skin due to a tiny animal known as the arcus or sarcoptes scabiei. The female burrows into the skin in order to lay her eggs and the condition which follows is one of intense itching. (*See also* THE ITCH.)

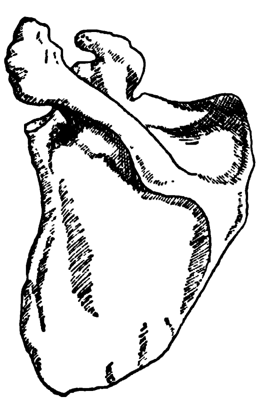
SCALD is inflammation or damage to tissues by the action of hot liquids or gases. It resembles a burn in every way except how it is caused, and the treatment is that of a burn. (*See also* BURN.)

SCALE is a tiny flake of dead skin which is thrown off by the skin. Many such scales may be thrown off in the late stages of an attack of scarlet fever, when the process is called desquamation. If the scales which are shed are very fine, they are described as branny scales. (*See also* DESQUAMATION.)

SCALP consists of the three outermost layers of the covering to the top of the skull, or cranium. Actually there are five layers covering the bone, these being the skin, the fatty layer, a specialized portion of muscle called an aponeurosis, a loose connective tissue layer, and a thick membrane called the epicranium. Owing to the looseness of the connective tissue layer under the muscle aponeurosis, the scalp can be moved fairly easily by pushing it with the fingers, and some people can move the muscle itself, so that they can move the scalp backwards and forwards at will. The fat underneath the skin of the scalp has a rather curious distribution. It is not packed loosely as in most parts of the body, but is disposed in more or less separate compartments. So that if an abscess or any other inflammation arises in the scalp it does not spread very far because of this curious distribution of the fat, which confines it to a small space. But if a wound is made into the scalp below the muscle aponeurosis, infection can easily travel along the loose connective tissue in this layer, and so the whole scalp might possibly be raised from the bone by a layer of pus. Because of this danger, wounds of the scalp must be kept very clean and it is advisable to shave the scalp all round the wound.

Scales are often shed by the scalp, and these are described as dandruff. Cysts are fairly common on the scalp, caused by blocking up in the sebaceous glands of the products of their activity. These cysts are called wens. (*See also* DANDRUFF; WEN.)

SCAMMONY produces a root from which a resin is extracted which used to be employed, especially in gout, to cause violent purgation. This resin, when purified, is known as scammonin, and produces copious watery motions a few hours after it has been taken. It may be given in pill or powder form. It forms an ingredient of the compound colocinth pill, which was always given in bygone days as part of the treatment of gout. Scammony resin is also contained in a compound powder which has in it ginger and jalap in addition to scammony. This powder causes even more drastic purgation than does scammony alone in virtue of the jalap it contains. (*See also* CATHARTIC.)



Scapula

SCAPULA is commonly known as the shoulder blade. It is a broad, triangular bone which lies on the upper part of the back of the chest, to which it is firmly attached by strong muscles. If these muscles are paralysed that part of the scapula facing the spine will be so turned that its edge can be seen when the arm is pushed forwards. This condition is called winged scapula. As the bone is triangular, it has three angles. The bottom one is called the inferior angle of the other two angles, the

superior one is that facing the spine, whilst the external angle is replaced by a thickened mass of bone in which there is a cup-like cavity in which the head of the arm bone,



Scapula, viewed from behind
A—showing glenoid fossa at upper end, where the humerus articulates

the humerus, rests. From the front of this thickened mass of bone runs a beak-like piece of bone, the coracoid process, which serves as an attachment for the important biceps muscle. On the back of the scapula there is another thickening of bone, called the spine of the scapula, which runs in an upward and outward direction, at its outer edge being much thickened to form a process, called the acromion, to which the collar-bone is attached by means of a joint. Injuries of the scapula are not very common as it is well protected by muscles. Occasionally the coracoid process and the acromion may be broken off as a result of injury to the shoulder joint.

SCAR is the natural result of healing of tissue which has been damaged or destroyed by injury or disease. The space left by loss of tissue is gradually filled up and bridged by a mass of cells, some of which are newly formed in the tissues themselves, and others which have come from the blood vessels in the neighbourhood of the damaged tissues. This mass of newly formed cells is called granulation tissue. At first, many blood vessels are formed in this granulation tissue; but later, as the granulation tissue becomes converted into ordinary connective or fibrous tissue, these blood-vessels are squeezed out of existence, having served their purpose in nourishing the granulation tissue. So a recent scar is bright pink in colour, whilst an old scar is white. Connective fibrous tissue occupies less space than does the granulation tissue, so the final area of the scar is less than it would appear to be at first. When a scar occurs in the region of a joint some deformity is sometimes found after complete healing has taken place, as the contraction of the connective tissue alters the position of the joint. If a nerve happens to be included in a scar, much pain may be caused by pressure of the connective tissue on the nerve. Overgrowth of a scar is referred to as akeloid. (*See also* GRANULATION TISSUE; KELOID.)

SCARF SKIN is the outermost layer of the skin.

SCARIFICATION is the act of making superficial cuts into the skin so that little, or better still, no blood is drawn. The most common use of scarification is in vaccination. It is also used in the operation of cupping. (*See also* CUPPING.)

SCARLET FEVER is an acute infectious disease caused by a certain variety of the germ known as the streptococcus, which enters the body through the nose and throat, and first produces its effects in a localized sore throat. Afterwards, when general spread of the infection occurs, constitutional symptoms and a characteristic rash appear, the results of spread of the poisons produced by the germ in the throat and nose. Scarlet fever has long been known to physicians: it was first called by its name by Sydenham in 1676, and it owes its name to the vividness of its rash. It has been noticed that the severity of the disease has greatly lessened in recent years, and as at the present day a test called the Dick test is available to see whether people are likely to become infected by the disease or not, it is hoped that by giving those who are infected the appropriate serum—derived from the dead bodies of the germs which cause the disease—it may be almost stamped out, at least in its severe form.

Scarlet fever is a disease of childhood, especially of the ages between five and ten years. But it is much more fatal in children up to the age of three years than in older children. The onset of the illness is usually abrupt: the incubation period is commonly two to three days, but may be anything from one to seven days. Sore throat, vomiting, headache, shivering fits, and a rise of temperature up to 102° to 103°F. and a quick pulse are the usual symptoms. The throat is very red and the tonsils also appear intensely red. The tongue is furred at the onset

of the illness, and often has the appearance which gives rise to the term "white strawberry tongue." The surface is covered with a creamy white fur through which bright red spots project. Later, the fur strips off from the edges inwards, leaving a perfectly clean, bright red tongue, to which the name of "red strawberry tongue" has been applied. On the second day the rash appears. This is seen first on the neck, then it spreads down gradually over the body and limbs, but rarely appears on the face. The forehead and cheeks are flushed, and there is a pale area round the mouth which forms a striking contrast. The rash is composed of tiny red spots, each being surrounded by a paler pink area. These spots are so closely packed together as to give the appearance of intense redness to the skin. The rash fades in the same order in which it appeared, and this is followed by peeling of the skin which was affected by the rash. Peeling goes on for at least two to three weeks, and the skin peels off in fine flakes—which are infectious. Even in a case of simple scarlet fever, without any complications, there is often some enlargement of the glands of the neck, but in the so-called septic type of the disease, this enlargement is marked, there is much discharge of pus from the nose and septicæmia may end the disease fatally. In rare cases, the poisons produced by the germs are so powerful that the body is unable to cope with the invasion and death takes place after only a few days' illness, during which there is high fever, continued vomiting and delirium. (*See also* SEPTICÆMIA.)

Complications of Scarlet Fever.—These are so important that it is safe to say that for every child scarlet fever kills there are hundreds on whom it leaves some permanent mark. The most common of all the complications is middle ear disease. Young children, especially those with enlarged adenoids and tonsils, are most liable to this complication. Rupture of the drum of the ear and the discharge of pus—which may continue for months or even years—is the usual sequel, unless the drum is cut at the most suitable point by the ear surgeon, when the condition in favourable cases clears up rapidly. Infection may travel backward from the middle ear and cause disease of the mastoid air cells, in which case an operation on the mastoid (simplemastoidoperation)wouldbenecessary.

Another serious complication of scarlet fever which occurs in the second or third week of the illness is inflammation of the kidneys. The amount of urine passed is greatly diminished and contains albumen and blood. Swelling of the feet, legs, and face accompanies this complication, which may become chronic and leave the victim with permanently damaged kidneys. In order to recognize the complication at the earliest possible moment, the urine should be examined at frequent intervals during the course of the illness.

Inflammation may occur in the joints, the picture then resembling that of acute rheumatism, and sometimes the heart may be involved also. Cases of scarlet fever are very liable at any stage in the illness to catch diphtheria, possibly owing to the damage already done to the tissues of the throat.

Treatment of Scarlet Fever.—Until quite recently the treatment of scarlet fever was simply that of an infectious disease, and of the condition of fever; but, since the discovery that the germ causing the disease produces a poison or toxin, like the germ which causes diphtheria, it has been possible to make an anti-toxin in the same way that diphtheria anti-toxin is prepared, and this is given in suitable doses, depending on the severity of the case. In most cases, one or two injections are given into the muscles; in a severe case, the injection is given into a vein. The effects are commonly produced within twelve hours; the temperature and pulse rate fall, the general symptoms of germ poisoning are lessened or may even disappear and the rash fades. There is ample evidence that the injection of scarlet fever anti-toxin reduces the liability to complications and shortens convalescence.

It is very important to prevent the spread of the germs causing the disease. Close contact with a person suffering from it is usually the way it is conveyed, but clothes from the patient, or things handled by the patient may also spread infection. Epidemics have been known to have been caused by infected milk. Patients who are convalescent may yet carry the germs of the disease in their throats and so infect others. That is why isolation of patients is insisted upon for at least four weeks. As long as there is any discharge from the nose, the patient can infect others by "droplet" infection.

Treatment of the complications of scarlet fever will be found under their appropriate headings.

SCHICK REACTION.—This reaction is a test which shows whether a person is liable to develop diphtheria or whether he has sufficient natural resistance to withstand the infection. The method was devised in 1913 by B. Schick, an Austrian physician.

In this test some of the poison obtained from the diphtheria germ is injected between the layers of the skin (intra-dermal). The poison is specially weakened so that it becomes less dangerous. When weakened the poison will not keep, and it must be kept in an ice-chest and used at the latest within a week, preferably within 24 hours of its being weakened.

Some diphtheria toxin which has been heated to 75° C. for 10 minutes is also required. With a suitable syringe the toxin is injected; this forms a small swelling or weal in the skin which lasts for a few minutes to half-an-hour. Some force is required for this injection into the layers of the skin, and it is essential that the needle of the syringe should fit accurately to prevent leakage. The syringe is now washed out and an equal amount of the heated toxin is injected in a similar manner into the opposite arm.

The resulting reactions are noted after 24, 72 hours and ten days. Four possible reactions may occur:

Positive Reaction.—After 24–36 hours a dark raised swelling, about ½ to 1 inch in diameter, round or oval in shape, is seen at the place where the toxin was injected. There is little hardening of the skin round. The swelling reaches its maximum about the third day and then gradually fades away during the course of a week. The skin becomes dark and later will flak off up till the tenth day. This is a positive reaction and the person is liable to contract the disease. The other arm used as a control in which the heated toxin was injected shows no reaction.

Negative Reaction.—This is interpreted as showing that the individual contains sufficient antibody—substance which can deal with the toxin—in the blood to render him immune to infection by the diphtheria germ. No swelling appears after the injection, and if any redness is seen it is present in the form of a line along the track of the needle. The other arm used as a control also shows no reaction.

False or Pseudo Reaction.—Here a false reaction occurs, not due to the toxin, but to the presence of other bodies which are present in the toxin solution. It indicates that antibodies are present in the blood, and that the individual is immune to diphtheria. These reactions have been found more commonly in those previously examined who originally gave positive reactions, and then later a negative one, and who had, therefore, developed immunity themselves. The characteristics of this reaction are the rapid appearance of a bright red swelling without any sharp edges, leaving behind little or no deeper colouring of the skin and not followed by any flaking. It occurs on both arms and to the same extent.

Combined Reaction.—This is evidence that the individual is susceptible to diphtheria and also to the other unknown substances. It probably represents a transitional stage between susceptibility and immunity. A reaction is obtained in both arms, that on the control side being a pseudo or false reaction; whereas that on the injected arm is a combination of a pseudo reaction and a positive reaction. It therefore lasts longer and results in some colouring of the skin and some subsequent flaking of the skin.

It has been found that about 20 per cent. of adults give a positive reaction. Only 18 cases of diphtheria have been met with in a population of over 20,000 Schick-negative individuals during a period of six years, and the disease was invariably slight, with little or no general effects.

Immunization.—This can be "passive" or "active." Passive immunization means that some ready-made antibody is injected into the body and will protect it from the diphtheria poison for a short time. Active immunization means that the body is made to manufacture its own antibody for any future occasion and will always be there to deal with a dose of diphtheria toxin.

Passive Immunization.—This is done by giving diphtheria anti-toxin, and is the only method available for treatment of an active infection of diphtheria.

SCHOTT-NAUHEIM TREATMENT is the treatment of heart disease, especially that type of heart disease in which the muscle of

the heart is affected, by means of warm salt baths and carefully graduated exercises. The treatment was first given at the German spa Nauheim, by the physician Schott, hence its name. The waters at Nauheim are charged with carbonic acid gas, and are mildly stimulating. The exercises are performed by the patient against a gradually increasing resistance made by the nurse, the amount of the resistance being dependent upon the progress made by the patient.

SCIATICA is an inflammation of the supporting tissues of the sciatic nerve. The delicate nerve fibres themselves are seldom, if ever, affected. The symptoms of sciatica may be copied by such conditions as arthritis of the hip joint, or a tumour pressing on the trunk of the nerve, but other signs are present in these conditions by which they may be distinguished from true sciatica. The symptoms of true sciatica are very characteristic and consist in pain along the course of the nerve from the buttock to the ankle. The nerve itself is tender to the touch and much pain is produced on stretching the nerve by bending the extending leg at the hip joint. When standing up, the victim of sciatica rests his body, weight on the sound limb and holds the painful leg slightly bent at the hip and knee, turned slightly inwards and with the heel raised from the ground. In most cases the pain is most severe at the onset of the attack, and if sufficient rest is given to the nerve the pain gradually lessens within the course of a few weeks. In some cases, however, the pain persists, though in a milder form, and the condition may become chronic with more sharp attacks occurring during the winter months. The cause of sciatica is unknown, but frequently it has been noticed that an attack follows an injury to the leg, or exposure to cold. There is much evidence for considering sciatica as a rheumatic disorder, the supporting tissues of the nerve being attacked by the rheumatic process. Sciatica is a disease of early and middle adult life and it is most common in men. Consequently, effective treatment is all important if the bread-winner is not to be laid low for many weeks.

In the very acute stages of the attack, when pain is intense, rest in bed is essential. The leg should be steadied by means of sandbags or in a light splint if this can be borne. Hot applications to the limb sometimes give relief. It may be necessary in the most painful stage to give drugs to ease the pain. After the severe pain has passed, the injection of oxygen into the back of the thigh near the nerve may be considered, or if the attack shows no signs of clearing up within a reasonable time, the injection of a salt solution into the sheath of the nerve may be undertaken. The injection has the effect of breaking down all the unwanted bands of supporting tissues which have been formed as a result of the inflammation. After such an injection massage and movements of the limb are useful. It is rare for one severe attack to clear up completely and then return, but chronic sciatica with repeated acute attacks may need prolonged treatment. In these chronic cases it is sometimes found that they are being kept up by poisons —from bad teeth or loaded bowels—which are circulating in the blood. In such cases, of course, these conditions must be attended to and cured. Sciatica is sometimes seen in diabetes, but in this disease it is rare for the sciatica to affect one nerve only; nearly always, both sciatic nerves are painful. With suitable treatment of the diabetes, the sciatica gets well.

SCIATIC ARTERY is an old name for the inferior gluteal artery, which accompanies the sciatic nerve at the point where it leaves the pelvis to enter the buttock. This artery is so deeply placed in the buttock that it is seldom damaged by wounds or other injuries. It supplies blood to the buttock muscles.

SCIATIC NERVE is the largest nerve in the body, being about the thickness of the little finger. It supplies all the muscles at the back of the thigh, the calf and the foot and in addition, it contains many fibres which convey sensation from the skin of the back of the leg and foot. Thus the sciatic nerve has a very wide distribution. At the back of the knee-joint the nerve divides into two branches, the internal and external popliteal nerves. The external popliteal nerve lies very near the surface at the lower part of the back of the knee-joint and may, in a thin person, actually be felt. Inflammation of the sheath of the sciatic nerve is called sciatica.

The small sciatic nerve is a nerve which only contains fibres conveying sensation from the skin. It supplies the skin of the buttock, the back of the thigh and the upper half of the skin of the calf. (*See also* SCIATICA.)

SCIRRHUS is a particular type of cancer which is characterized by its hardness and firmness. This is due to the fact that it contains a large amount of connective tissue which has been formed in an attempt to stop the progress of the tumour into healthy tissues. This connective tissue is not really a part of the tumour itself; it is a defence reaction in the surrounding tissues. A scirrhus cancer is especially common in the breast and in the prostate. (*See also* CANCER.)

SCLERA is the hard white membrane which, with the cornea, forms the outermost coat of the eye. It is continuous with the cornea in front and with the sheath of the optic nerve behind. (*See also* EYE; CORNEA.)

SCLERODERMA (Hidebound Skin).—This disease is characterized by a hardening of the skin, and is found in two forms, the diffuse and the circumscribed. The latter is often called morphœa (Greek, morphe, a shape).

Diffuse scleroderma usually affects a special region of the body such as an arm, or one side of the face and neck. Sometimes the hardening is preceded by a condition of brawny swelling. It prefers the upper parts of the body, occurs more often in women, and usually begins in the thirties. There is very little to be seen, except that the affected skin is perfectly immovable, especially noticeable when the face is affected. On feeling the part the change in the skin is very noticeable. It feels cold and hard, and is sometimes described as corpse-like. As the disease progresses, the underlying tissues become affected, and the skin contracts, so that it may actually crack and form ulcers. If the chest or face are affected, it will be increasingly difficult to breathe and eat.

Morphœa appears as rounded patches, "old ivory" in colour, which have the appearance as if a piece of leather had been inserted into the skin. The patches are usually surrounded by a pinkish-violet ring. On the limbs, morphœa appears in "ribbon" form.

In some cases death occurs through interference with breathing or eating, but many cases slowly clear up. The cause of the disease is unknown.

The treatment consists chiefly in building up the general health and in *time*. Many medicines have been suggested, thyroid substance being the most useful. Local applications are useless. X-rays produce good results in some cases. Massage, warmth and protection are recommended.

A form of the disease occurs rarely in ill-nourished infants shortly after birth. The outlook in these cases is grave. Treatment consists in very careful nursing, and warmth.

SCLEROSIS means hardening and is used to indicate certain changes in tissues, which as the result of disease, become firmer than normal. Hardening of the arteries, or arteriosclerosis is due to a thickening of the middle and inner coats of their walls with the deposition in them of lime salts. In the nervous system, sclerosis is due to an increase in the supporting tissue, either as an after-effect of inflammation or secondarily to disease of the arteries supplying the brain. In the liver, such a hardening is due to an increase in the connective tissue (fibrous tissue, as it is called), and the condition is then called cirrhosis. This condition in the liver is seen most often as the result of long-continued poisoning by such a drug as alcohol, but it may also occur as a result of infection.

SCOLIOSIS.—This term is applied to a certain form of curvature of the spine. (*See also* SPINAL CURVATURE.)

SCORPION BITE.—The scorpion sleeps during the day, but by night goes abroad to hunt its prey. It only attacks when interfered with or cornered. It grasps with a pair of very strong pincers, but injects the poison—to which the danger of the bite is due—by means of a poison-spine in its tail. Scorpion poison bears some relationship to the poison produced by the germ of diphtheria, and may prove fatal to children. The treatment, which is the same as for snake-bite, is described under the heading BITE.

SCROFULA is the old name for tuberculosis of the lymphatic glands and bones. (*See also* TUBERCULOSIS.)

SCROFULODERMIA is a skin infection which is due to tuberculosis. It is marked by shallow, irregular ulcers, which contain a cheesy material. Most commonly the skin condition is secondary to the tuberculous disease in a gland, or rarely, to tuberculosis of an underlying bone or joint. (*See also* TUBERCULOSIS.)

SCROTUM is the pouch which contains the testicles. It consists of two pocket-like compartments, lying side by side, the division

between them being marked by a seam on the surface. The left compartment is the larger and hangs lower down. Underneath the skin of the scrotum, which is thin, and brown in colour, is a layer called the dartos, which contains many muscle fibres. When these fibres contract the skin of the scrotum is thrown into folds. Swelling of the scrotum may be due to an enlargement of the testicle itself, or to a hernia (q.v.), or to a collection of fluid, which is called a hydrocele, or to enlarged and congested veins, which condition is called a varicocele. Eczema of the scrotum may be caused by irritation from chemicals and is often seen in paraffin workers, tar workers and chimney-sweeps. In these occupations also, cancer of the scrotum is more common than it is in occupations which do not involve the handling of irritant particles. In order to reduce the risk of cancer, persons engaged in these trades should observe strict cleanliness.

SCURVY is due to an error in diet which is now known to be due to lack of a vitamin, vitamin C. For hundreds of years it has been recognized that seamen who were fed on salted meat with few or no fresh vegetables developed this condition, but until comparatively recently the association of the prevention of it by including fresh fruit in the diet with the existence of a special vitamin was unknown.

Scurvy is rare in adults; in children, however, the condition is not uncommon in those who are fed only on boiled or preserved milk or unsuitable patent foods. Scurvy in adults comes on very gradually with progressive loss of weight and strength, whilst pallor of the face is very noticeable. The gums become soft and bleed easily, whilst the teeth loosen and may drop out. Bleeding also may occur from the nose, and blood may appear in the urine and stools. Numerous small areas of bleeding appear in the skin and a very slight injury, such as a knock, may be followed by bleeding underneath the skin. The patient is depressed and suffers from sickness and diarrhœa.

Scurvy in children is often called Barlow's Disease, after the English physician who first described it. In children the disease commonly arises about the end of the first year of life. The child looks pale and anæmic, its gums bleed readily and any teeth present may drop out. The characteristic feature of scurvy in children is the pain and tenderness of the bones, especially near the joints. This tenderness is so great that the child does not wait to scream until the limb is touched; it yells as soon as anyone approaches and appears to be going to touch it. The cause of this painful tenderness is bleeding under the external covering of the bones, which is not only very painful, but also causes swelling of the limbs. The child lies quite still, afraid to move because of the pain, and this may give the impression that the child is paralysed. In not a few cases infantile paralysis has been thought to have attacked the child, whereas the administration of the correct vitamin cured the condition in a few weeks. Acute rheumatism and scurvy may also be confused; but, as a general rule, rheumatism does not affect children as young as one year old, and scurvy is very rare in children over the age of three.

Treatment.—Treatment of both the adult and infantile forms of scurvy consists in giving a diet which contains sufficient vitamin C. This vitamin is found in fresh fruit of all kinds, but particularly in the lemon and orange. All green vegetables contain vitamin C, but some contain it in greater amount than others. Tomatoes are the best vegetables for use in the treatment of scurvy, and it is a curious fact that when they are tinned they still retain their vitamin content. Therefore, in the winter, when fresh vegetables are scarce and expensive, tinned tomatoes should be taken frequently. In children who are the victims of scurvy, the sweetened juice of two or three lemons should be given daily as well as fresh tomato juice. Recovery is the rule in scurvy, except if there has been such an occurrence as bleeding into the brain which, fortunately, very rarely happens. (*See also* INFANTILE PARALYSIS.)

SEA-BATHING.—For those whom it suits, sea-bathing is an excellent "tonic," and a most wholesome exercise.

General Rules.—Do not bathe when overheated or very fatigued. Do not bathe just after a meal, for there is no surer way of inviting cramp; nor when the stomach is empty, as this may induce a very persistent chilliness. Generally speaking, about 11 a.m. and 3 p.m. are good hours; the bathe should be taken in bright sunlight, if possible. Little more than a plunge in and out is quite long enough for a first bathe, gradually lengthen-

ing the time to ten or twenty minutes. Never stay in till chilliness is felt, or at least leave the water as soon as this occurs. Some people can stay in far longer than others; each individual should judge the time for himself and regulate his bathe accordingly. For the ordinary bather it will generally be less "shocking" to walk out and gradually accustom oneself to the waves than to plunge in. A brisk rub-down with a rough towel, and a sharp walk or run, should follow the bathe. A hot drink of tea or coffee (not alcohol) should be taken if any chilliness has been felt.

In debility.—No doubt many of the benefits ascribed to sea-bathing are due to the change of air, scene, and company; but it has definite additional advantages. People who are debilitated, especially children, are often very much benefited, but in these cases sea-bathing should be indulged in with caution. It is generally best to begin with warm or tepid sea-water or brine baths, gradually decreasing the temperature till a perfectly cold bath can be taken, before proceeding to take the open-air sea-bathe. There are some people who, with all precautions, always feel chilly and perhaps "headachy" after a bathe; they should definitely give up the practice, as it is only doing them harm.

When to avoid.—During pregnancy, though it has never been definitely proved that sea-bathing is harmful, it should be avoided. If there seems to be a tendency to miscarriage, it should most certainly be forbidden. No harm is done by sea-bathing during the period of menstruation, but it will sometimes be found that the discomfort commonly felt at this time is increased thereby. The individual must judge for herself. She should, of course, refrain from attending public baths during the period.

People who suffer from attacks of giddiness or faintness from any cause, palpitation, high blood-pressure, or any heart condition, should not sea-bathe without first consulting their medical adviser; and, naturally, any acute condition forbids it.

Skin Diseases.—With regard to skin diseases, if there is a good deal of *hyperæmia* (i.e. redness of the skin due to an increased blood-supply) or moisture present, sea-bathing will aggravate the condition. Sometimes, however, in the "dry" types of skin disease—this is especially seen in the case of *psoriasis*—its tonic effect is beneficial. It should be discontinued on the slightest sign of increased irritation. (*See also* PSORIASIS.)

SEASICKNESS.—Here are a few suggestions to assist those who are not experienced enough to have made their own individual rules:

On the day before the voyage, take an aperient.

An hour or two before going on board, take a little light food and a cup of strong coffee (this upsets some people but may suit others.)

Secure a good position on the boat, away from the sides; a deck chair; have a rug over your knees, close your eyes, sleep if possible, if not, think pleasant thoughts.

If, after all precautions, sickness does come on, a hot drink (not alcoholic) from a thermos flask may help, or a saline effervescent drink. Chloretone in 5-grain capsules, one every hour, should be taken during the crossing if necessary.

SEBACEOUS GLANDS are attached to the pits or follicles out of which the hairs grow. They pour forth an oil product called sebum, which keeps the hairs and outermost layers of the skin smooth, slightly greasy, and therefore watertight. Sometimes the passage or duct leading from the glands into the hair follicles and skin become blocked and the sebum collects behind the obstruction, producing a cyst or wen. Over-production of sebum gives rise to an oily condition of the skin and leads to seborrhœa and acne. (*See also* ACNE; SEBORRHŒA; WEN.)

SEBORRHŒA (Greasy Skin).—This term means excessive activity of the sebaceous glands of the skin, so that the skin and scalp tend to be oily. In itself, it is of little importance except from a beauty point of view. It does not affect the health in any way, the patient's only complaints being those of a sallow oily skin, sometimes with prominent "plugs" of cheesy matter, and greasy hair.

It is important, however, in that a greasy skin predisposes to the growth of disease germs, and therefore to other and more serious skin complaints, such as the various inflammations.

The condition is a very common one, being found most often in brunettes, and associated with a coarse, large-pored skin and superfluous hair.

Treatment.—The head should be washed daily with soap spirit, or, if this is irritant,

with a milder soap. Slight cases will be cured by this means alone, but as a rule seborrhœa of the scalp is very obstinate to treatment, and other measures will be required. A sulphur and salicylic ointment is the best, or a lotion may be used. For treatment of cases where a true dermatitis occurs, *see* DERMATITIS. Seborrhœa of the face is treated in the same way as acne vulgaris.

SECRETION is the result of a function some cells have of separating certain substances from the blood out of which other substances are formed and returned to the blood, either by means of a passage called a duct, or by being poured straight into the blood stream. When a secretion is poured straight into the blood it is called an internal secretion. Such a secretion is produced by the cells of the thyroid gland, the suprarenal gland, the pituitary gland and the genital glands. The cells of such glands as the salivary glands, the liver, and the pancreas, on the other hand, convey their secretion to the body cavities by means of ducts. Secretion is mainly under the control of the nerves; but some cells, particularly those of the glands of internal secretion, are excited to action by means of hormones. (*See also* DUCTLESS GLANDS.)

SEDATIVE is a remedy which lessens excitement and reduces excessive activity. Many drugs are general sedatives. Of these, opium and the bromides are the best known. Other sedatives are selective in their action, having an effect on one system or organ alone. For example, bismuth salts and weak prussic acid reduce the activity of the stomach. Any drug which relieves pain or itching in the skin may be called a local sedative. But there are other sedatives than drugs. Hot baths, especially if taken for a fairly long time, are excellent as a general sedative; whilst the application of dry or moist heat to the skin locally also can be regarded as having a sedative effect.

SEDENTARY HABITS.—An indoor life deprives people to a greater or less extent of that amount of bodily exercise which is necessary to keep them fit. The deprivation of fresh air and sunlight also has a bad effect on the health. In addition, most people who are not engaged in hard physical work eat too much for their actual bodily needs. Constipation, flabby muscles, indigestion and a feeling of general slackness are the outcome of allowing sedentary habits to develop. Obesity also generally results. Sufficient open-air exercise after the day's work is finished, a few physical exercises in front of the open window in the morning are habits to be acquired by those who would limit the disadvantages of their unnatural indoor life. Diet also is important, and the correct diet for those who follow a sedentary life is a fruit and vegetable one with little red meat and not too much bread. Over-indulgence in tea and coffee should be checked, and at least two pints of cold water per day should be drunk, preferably between meals. In fine weather, walking part of the way to work will prove of great benefit to the general health. (*See also* DIET; EXERCISE; VENTILATION.)

SEIDLITZ POWDER is a saline purgative which consists of a white paper containing 35 grains of tartaric acid and a blue paper containing 40 grains of sodium bicarbonate and 120 grains of sodium and potassium tartrate. The contents of the two papers are mixed in a glass of water and drunk whilst the mixture is still fizzing.

SELENIUM is a non-metallic element which resembles sulphur. It has been used in the treatment of cancer which cannot be operated upon, but its value has not yet been proved.

SELTZER WATER is also known as Selters water and is a sparkling mineral water which is found in springs at Selters in Germany. It contains sodium bicarbonate, a small quantity of common salt and certain other salts. An artificial preparation resembling the natural water has been made.

SEMEN.—Semen is the fluid of the male which is secreted by the testicles and contains spermatozoa, the male generative element. It is referred to as the seminal fluid. (*See also* TESTICLE; SPERMATOZOA.)

SENEGA is the root of seneca snakeroot, a plant of North America. From it are prepared many medicinal drugs, as it contains substances which loosen a cough and enable the sticky expectoration to be brought up easily. In large doses it causes vomiting. Its chief uses are in the later stages of pneumonia, in asthma and in chronic bronchitis.

SENILE DECAY is the result of age upon the various organs of the body. These are discussed under the heading of AGE CHANGES.

SENNA consists of the leaflets of a pea-like plant which is found in Egypt and the East Indies. It is one of the most popular of all purgatives, as apart from the official preparations the active agent in senna can be extracted by leaving the pods to soak in cold water overnight, the resulting liquid being drunk. Women, especially, seem to have a preference for this purgative in spite of the fact that it causes much griping. One advantage of senna is, however, that it does not produce a reaction in the shape of constipation following its use. The griping effect is prevented in the official preparations by combining it with belladonna or some other drug which stops spasm.

SENSATION is the means by which we are made aware of our bodies and of the surrounding world. Sensation may be divided into various groups: (1) Sensations which arise within our bodies, in the heart and blood-vessels, the lungs, the digestive system and from the muscles, the joints and the tendons; (2) "Common" sensations, which arise very early in our mental development, and are the sensations of heat, cold, and pain, and the sense of coarse touch (as whether an object is large or small); (3) Special sensations, which are sight, taste, hearing and smell, and the sense of fine touch which enables us to appreciate, for example, the fact that a hair has brushed over our skin. All sensation is conveyed along the nerves to the central nervous system, where, in the spinal cord, certain forms of sensation are gathered up into bundles of nervous units which run upwards into the brain.

One contains all those nervous units which enable us to say whether something we touch is hot or cold as well as those through which we recognize that something is hurting us. In another bundle are collected all those nervous units which tell us of our position in space, whether we are standing on our head or our heels, and also those which allow us to judge of the size, shape and form of objects around us without using our eyes. These bundles are packed quite closely together in the spinal cord, so that any disease or injury to the cord may easily damage the bundles which are conveying sensations to the brain. For example, in locomotor ataxia (q.v.) the bundle which tells us of our position in space is damaged, and so a patient who suffers from this disorder cannot tell where his nose is when his eyes are shut, and if asked to point with one finger to his nose with closed eyes, he is quite unable to do so. In certain diseases of the nervous system the bundle which carries the pain units is damaged, and so patients may burn their hands without feeling any pain and only realize that they have been burnt when they see the marks. These bundles of nervous units which carry various forms of sensation end in different parts of the brain, and we are only consciously made aware of such sensation as it is necessary for our well-being that we should know. For example, it has been shown that if anyone places his hand on a hot stove the movement of drawing the hand away takes place before the person is aware that he has been burnt. We are made aware of the fact that we have been burnt in order that we may not consciously put the hand on the stove again, but the movement in response to the sensation was made, not through the control of the brain, but by the spinal cord and nerves.

SEPSIS is poisoning by the products of decomposition of tissues and is caused by the agency of germs. A wound invaded by germs which produce pus is called a septic wound and takes much longer to heal than one in which no such germs are present.

SEPTICÆMIA is a condition in which germs gain entrance to the general blood-stream from some part of the body and continue to live there. Although in many infections diseases, such as typhoid or pneumonia, the germs causing these conditions may get into the general blood-stream, they are soon killed off by the resistance which the patient develops, and the disease process then remains only in certain organs of the body. In true septicæmia on the other hand, once certain germs have got a hold it may be in some quite small and insignificant spot such as a finger prick, or a small wound in the skin, they are able to break through the barriers which separate them from the general blood-stream and are constantly passing into it, so that though they may not actually grow and multiply in the blood stream, the germs are constantly entering into the blood and the outlook for the patient is a poor one. There are two kinds of germs which commonly produce this condition of septicæmia. One kind forms long or short chains and is called the streptococcal group. The other kind when grown outside the

body, produces forms which resemble bunches of grapes. This kind is called the staphylococcal group.

Streptococcal Septicæmia is a particularly important form because it causes the death of thousands of mothers yearly. After an apparently easy confinement it is found that the womb has somehow become infected with germs of the streptococcal group and the onset of shivering attacks or rigors, associated with an irregular fever, diarrhœa and anæmia means that yet another life has to be sacrificed to septicæmia. Even more often does streptococcal septicæmia follow abortion, where often less care is taken to prevent germs from gaining admittance to the womb. Surgeons run the risk of streptococcal septicæmia if they prick a finger during a septic operation. The condition is always a very dangerous one and nearly always fatal.

Treatment.—The treatment is by means of what are called anti-streptococcal sera, which contain certain substances, that should normally be produced by the human body, to kill the germs. Many injections of these sera may have to be given. The only other measures to be taken are those designed to make the patient more comfortable. Tepid sponging if the fever is high; large quantities of fluid to drink; and a transfusion of blood to enable him to retain his strength must all be employed.

Staphylococcal Septicæmia is usually the result of an infection of the skin, such as the common boil. It occurs only in those patients whose resistance to disease is very low. The onset of septicæmia is marked by shivering fits and a high temperature; but unlike the streptococcal type of septicæmia, in this form, abscesses accompany the septicæmia state and these may occur in any part of the body, such as the kidneys, the lungs and the bones. Although this form does not run such a rapid course as does the streptococcal form, it is more difficult to treat on account of these abscesses and it often ends fatally after many months of illness. No anti-staphylococcal sera are yet available to help the natural resistance of the body which the invading germs have overcome, but there is every hope that in the near future such sera will be produced.

SEPTUM is a dividing wall between two parts of an organ or between two cavities. A septum may be of bone, of cartilage, of muscle, of connective tissue or of skin. For example, the septum between the two sides of the nose is mainly of cartilage; that between the two sides of the tongue is of a special kind of skin.

SEQUELA is any abnormal condition which follows, and is caused by an attack of a disease. For example, heart trouble is often a sequela of acute rheumatism. A sequela differs from a complication of a disease, in that it follows the disease and does not appear at the same time as the disease which causes it.

SEQUESTRUM.—This term is applied to a piece of dead bone which remains within the body. (*See also* NECROSIS.)

SERUM.—When blood is taken from an animal and allowed to stand quietly in a clean vessel it clots. This process consists first in the formation of a very fine net of fibrin crystals throughout the blood. After a time this net-work of fibrin shrinks and in doing so retains all the undissolved parts of the blood within its meshes, but squeezes out the remaining fluid. This is a clear, yellowish liquid called blood-serum, or more shortly serum. It differs mainly from blood in that it contains no cells or fibrinogen from which the fibrin of the clot is formed. Should the blood happen to contain substances which are poisonous to micro-organisms, or germs, so-called anti-bacteriological bodies, or substances which can neutralize non-living poisons, or toxins, so-called anti-toxins, then these will be present in the serum. Since the use of whole blood for the purpose of administering these anti-bodies is impractical, partly owing to the fact that it rapidly clots and thus cannot be stored, and partly because the blood cells of animals may be poisonous, serums are used in medical treatment.

Part of the defence mechanism of animals and man against disease due to certain living (germs) or non-living poisons is found in the blood itself. All healthy bloods are able to antagonize, to some extent, many poisons and organisms. This power varies from individual to individual, and from species to species, and is to some extent inherited. The blood, however, possesses the remarkable power to form new anti-bodies against special germs, or poisons. This is accomplished in two main ways. The first is the creation of a substance which combines with the poison, so forming a neutral non-toxic

substance. These anti-toxins are antagonistic only to the particular toxin. Diphtheria anti-toxin will only neutralize the poison made by the diphtheria organism. The poison of the lock-jaw bacillus (tetanus) can be neutralized by tetanus anti-toxin, but this is useless to treat diphtheria or any other disease.

Unfortunately only a small percentage of diseases are associated with well-defined toxins so that there are but a small number of active practical anti-toxins. The most important to-day are diphtheria, tetanus, gas-gangrene, and scarlet fever; to this group, however, can be added the immensely valuable anti-toxic substances available in the treatment of snake-bites and dangerous insect stings.

The second defence mechanism developed in the blood serum is the production of bodies which either destroy or inactivate organisms themselves. These substances are less well-defined than anti-toxins, and in some cases appear to be rather an added property of the blood, rather than the production of a substance which one may isolate. They are, however, also specific to the particular organism involved. Following nearly all fever-producing diseases (except those due to malaria and higher organisms) anti-bodies exist in the blood of the patient who has recovered, or is recovering. In some cases they persist for long periods, in others, such as influenza, they quite rapidly disappear. The serum of a patient just recovered from a particular disease may therefore be a valuable aid to the treatment of that disease in its early stages in another person. Many diseases, however, produce only a small amount of anti-bodies which on storage of the serum rapidly disappear, thus the practical use of such things becomes rather limited in its application, since it is not possible to have absolutely fresh serum available just when it is needed. A few good commercial serums exist, amongst the most important being the anti-meningococcic serum (anti-spotted fever), and one against a certain type of pneumonia. Serums are also used successfully in the treatment of anthrax and certain forms of blood-poisoning (septicæmia), erysipelas, and more recently infantile paralysis and measles.

Serums and Anti-Toxins used in Medicine.—In those diseases where powerful sera or anti-toxins are available they constitute the very best method of treating the disease, for it is the natural way by which the body normally conquers its enemy. To obtain the best results it is necessary to use these substances as early as possible so that the disease may be prevented from damaging the body. Diphtheria treated adequately on the first day of infection is practically non-fatal; on the sixth it kills about one in four persons. Furthermore, the use of these substances is also of the greatest value in preventing the onset of disease. (*See also* DIPHTHERIA.)

SERUM SICKNESS.—The reactions which take place in the body after an injection of serum, vary a great deal with each individual. In some people no reactions are felt at all; in many the effects are mild in nature, but there are a few cases in which the symptoms are very severe. Mild cases of serum sickness usually tend to clear up within a few days and no treatment is necessary apart from giving aperients and calcium salts. The symptoms in a severe case of serum sickness may take the form of fever, vomiting and diarrhœa, urticaria or nettle-rash, and often the glands become swollen. The symptoms begin about eight or nine days after the injection has been given.

Treatment.—Calcium salts or an injection of adrenaline should be given, and if the breathing becomes difficult, artificial respiration must be carried out. Any previous attack of serum sickness must be mentioned to the doctor before the injection of serum is given so that adequate precautions can be taken. (*See also* ANAPHYLAXIS.)

SESAME OIL.—Also known as teel or gingelly oil, sesame oil is greatly used in India and the African colonies, etc., instead of olive oil, to make ointments and liniment. (*See also* OLIVE OIL.)

SETON.—A thread or skein of threads drawn through a fold of the skin is described as a seton. A seton is a method of employing counter-irritation which prevents a wound from healing, and this state of affairs can be kept up as long as necessary. (*See also* COUNTER-IRRITANT.)

SEX HYGIENE.—The education of children in sex has been much argued, but it is possible to make too much of teaching "the facts of life." Children who keep rabbits or a cat soon learn a good deal about the facts of life, and the prospective arrival

of kittens, their birth, and their early feeding teach a child more, and in a far better way, than any lecture in the schoolroom. Puberty is the time for preliminary instruction No girl should be allowed to have the shock of a first menstruation without some knowledge of what it means. It is a mistake to treat menstruation as a disease and put a girl to bed because of it, and girls should be allowed to lead their ordinary routine of life and play games regardless of menstruation. In the same way emissions of semen at night in boys should be looked upon in the proper perspective. Seminal emissions are quite normal in boys at puberty, and any suggestion of "lost vitality" is simply nonsense. If they become too frequent a doctor should be consulted, and he will usually prescribe some simple sedative such as a bromide.

In the case of youths in early manhood sex may become an urgent problem. The best way to deal with the problem at this time is to push it into the background, or "sublimate" it, by emphasizing games and other interests and ambitions, or by a healthy interest in someone of the opposite sex. Young women are said to feel the urgency of this problem less than do young men, and those who do feel it are often looked upon as abnormal, but this is an unfair view. The modern young woman has her sex problems almost as much as the young man does, and her remedies are the same as his, which are mentioned above. Healthy companionship of the two sexes in work and play is the best safeguard against sex difficulties.

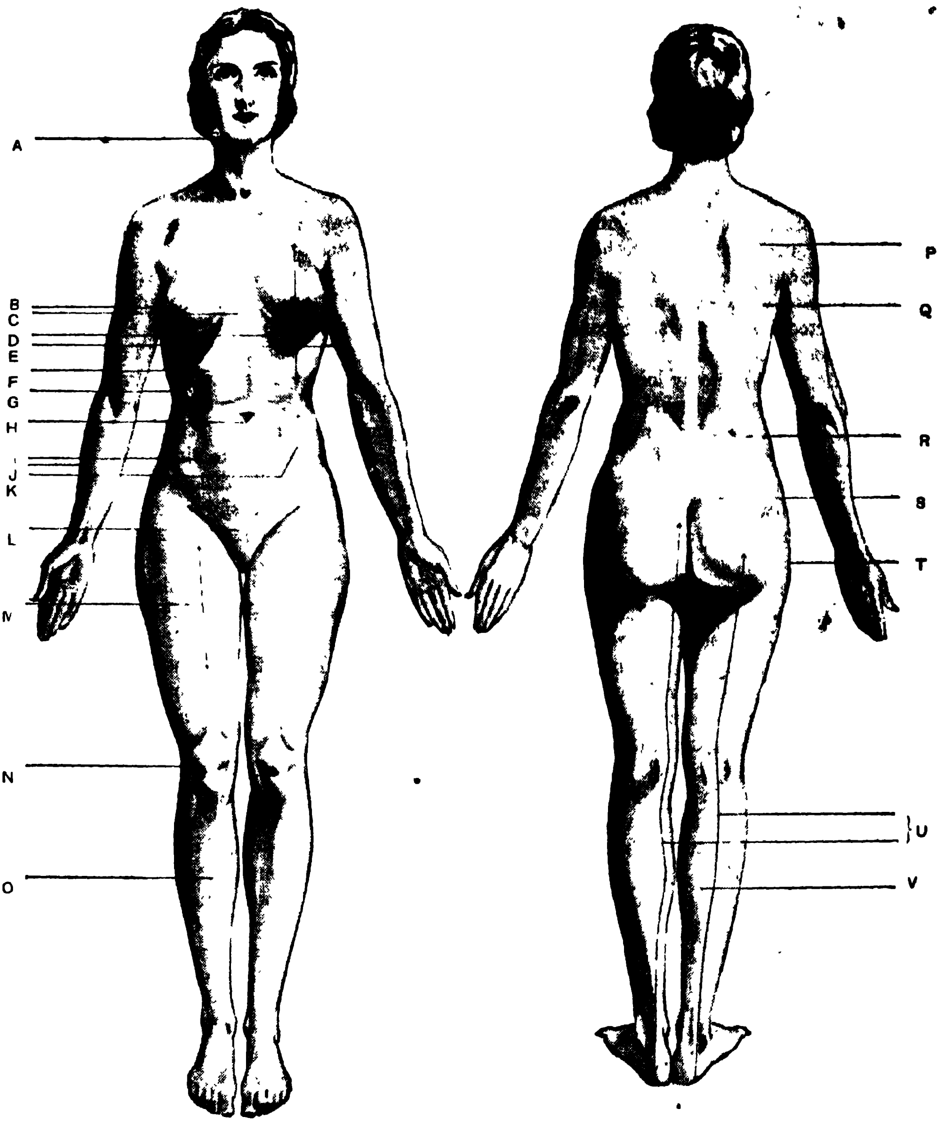
In early married life other sex problems arise. Every family doctor has known cases of young people who have not consummated their marriage simply because their knowledge of how the sexual act should be performed was inexact. In this regard the writings of Dr. Marie Stopes have been useful, although this writer has been criticized as being rather emotional in her viewpoint.

Nowadays, however, there are plenty of authoritative text books that will serve as counsellor and guide to young people.

Birth Control.—The first thing that all young married people ought to realize is that there is no convenient time for having babies, and that it is best for young people to have their babies right away and face possible hardships than to wait for a "convenient" time, which is hardly every likely to arrive. Methods of birth control have been in vogue since the earliest civilization of mankind, for that is what primitive "sex taboos" and infanticide really mean. Nature's plan, as that great philosopher, Dr. Havelock Ellis, has pointed out, is to provide an excess of offspring and to ensure that at all events a small proportion of them will escape the risks of destruction and carry on the race.

The human race has been kept within reasonable limits in the past by famine, pestilence and war. With the gradual disappearance of two of these—one would hope of all—other methods of birth control raise their heads. Even celibacy is essentially a method of birth control. In this country the Ministry of Health issued in 1930 a memorandum (153 M.C.W.) allowing local authorities to give instruction in birth control to expectant and nursing mothers who are already in attendance at maternity child welfare centres, and who need it on medical grounds. The National Birth Control Association, 26, Eccleston Street, London, S.W.1., under the presidency of Lord Horder, has been formed to organize the different societies and groups interested in birth control in this country. The Birth Control Investigation Committee, under the presidency of Sir Humphry Rolleston, subsidizes research work on the subject at the universities of Oxford, Cambridge and Edinburgh. The Constructive Birth Control Society, Whitfield Street, London, runs a clinic and travelling caravans to give free instruction in birth control to poor persons. There are other societies and clinics in different parts of the country, and more and more family doctors are becoming interested in the subject. One of the chief drawbacks, however, is that up to the present there has not been discovered a 100 per cent. safe single method of birth control, though there are a variety of methods, recommended by doctors and in authoritative text books, that are successful in a large number of cases.

SHINGLES (Herpes Zoster).—These names were originally applied to that form of the disease in which herpes started about the middle of the back, and crept round towards the front in girdle form. Thev are, however,



DIAGNOSIS DIAGRAM: THE FEMALE ANATOMY

Letters indicate the centres of the areas where warning pains may occur.

Mumps, toothache, neuralgia, tonsillitis, pharyngitis, laryngitis, diphtheria, scarlatina, adenitis.
Mastitis, cysts, malignant disease of breast; pregnancy.
Dyspepsia and other stomach diseases, bronchitis, aneurysm, angina pectoris, influenza.
- D Pleurisy, pneumonia, shingles, neuralgia, muscular rheumatism.
- E Rheumatism, neuritis, angina pectoris—usually left arm.
- F Dyspepsia and other stomach diseases, duodenal ulcer, pancreas disease, pneumonia, diaphragmatic pleurisy.
- G Liver diseases, gall-stones, gall-bladder diseases (especially at x), pneumonia or pleurisy, floating kidney.
- H Gastric ulcer, hernia in children.
- I Appendicitis, colitis, disease of right ovary.
- J Writer's cramp, etc.
- K Colitis, constipation, diseases of left ovary, obstruction of bowel.
- L Bladder diseases, diseases of ovaries or womb, inflammation of pelvis.
- M Diseases of ovary or womb, neuralgia, renal colic (one side), psoas abscess, inflamed glands in groin.
- N Loose cartilage, disease of knee-joint, disease of hip-joint.
- O Rheumatism, bone disease, phlebitis, neuralgia, neuritis.
- P Gall-stones, liver diseases.
- Q Liver pains, pleurisy, pneumonia, herpes zoster (usually right side).
- R Diseases of womb or ovaries, lumbago.
- S Sacro-iliac diseases
- T Hip-joint disorders.
- U Sciatica.
- V Muscular cramp, locomotor ataxia, neuritis, varicose veins, phlebitis, intermittent claudication.

See also frontispiece.

rather misleading, as the disease may affect any part of the body.

Symptoms.—The two main symptoms are pain, followed on the third or fourth day by crops of little blisters on a certain area. The pain may be very severe, and many cases are thought to be "neuralgia," "lumbago," etc., at first. The cause is an acute inflammation of a nerve centre, together with degeneration of the nerve fibres passing through it. Hence only that area of skin supplied by the affected fibres suffers. Second attacks are almost unknown.

Treatment.—The only local treatment required is to prevent breaking and infection of the blisters, as by an antiseptic dusting-powder, cotton-wool, and a bandage. The pain is treated by aspirin, phenacetin, etc., or in severe cases by morphia. Any case in which the face and eye are affected, or if the patient is elderly, need special care. A course of tonics, and especially a change of air, are valuable in convalescence.

SHOCK.—The sudden severe lowering of the vitality of the body, due to injuries, operations, or profound emotion. The essential feature in shock is a lowering of the blood-pressure, due to paralysis of the brain centre that controls the contracting of the blood-vessels. With the disappearance of this control the great veins—deep in the body—dilate, and the blood collects in them and leaves the brain and the surface of the body without proper blood-supply.

Treatment.—The patient is kept at rest, the foot of the bed is raised so that blood flows back into the brain, and hot-water bottles are put all round the patient (care being taken not to touch the patient with the hot bottle, as it may cause a severe burn) so that the blood is drawn back to the surface. A broad bandage may also be put round the abdomen to clear the blood from the dilated abdominal veins, and hot coffee, tea or other drinks may be given; alcohol is not good, as a depressing effect follows the preliminary stimulating effect. Injection of saline solutions, with glucose, and various drugs are useful, but must be left to the doctor.

SHORTNESS OF BREATH.—This condition may be a symptom in many different disorders, or, on the other hand, it may only occur after exercise and be unimportant. Shortness of breath is also known as dyspnœa or breathlessness. (*See also* BREATHLESSNESS.)

SHOULDER is the part of the body where the arm joins on to the trunk, formed by the meeting of the humerus (bone of the upper arm) with the scapula (shoulder-blade) and clavicle (collar-bone), and the muscles associated with them. The shoulder-joint is formed by a saucer-shaped hollow (glenoid fossa) on the shoulder-blade, into which the rounded head of the humerus fits and rotates. This joint is covered by a fibrous capsule and is protected by projecting processes from the shoulder-blade and collar-bone, to which ligaments are attached. But the strength and mobility of the shoulder-joint depend chiefly on the strong muscles—the biceps, triceps, deltoid, etc.—that join the arm to the trunk. The shoulder-joint is easily dislocated, but the dislocation is usually easily reduced without leaving serious after-effects. (*See also* FIRST AID SUPPLEMENT.)

SIALOGOGUE.—A drug which increases the flow of saliva is called a sialogogue. (*See also* SALIVA.)

SICK HEADACHE.—Intense headache, accompanied by a feeling of nausea, is called sick headache or migraine. (*See also* MIGRAINE.)

SICKROOM NURSING.—In almost all cases of serious accident or disease the patient is either removed from his home or a professional nurse is called in; but in minor illnesses and accidents the task of attending the sick devolves upon some member of the household, by whom the following simple rules of sick nursing may be found useful.

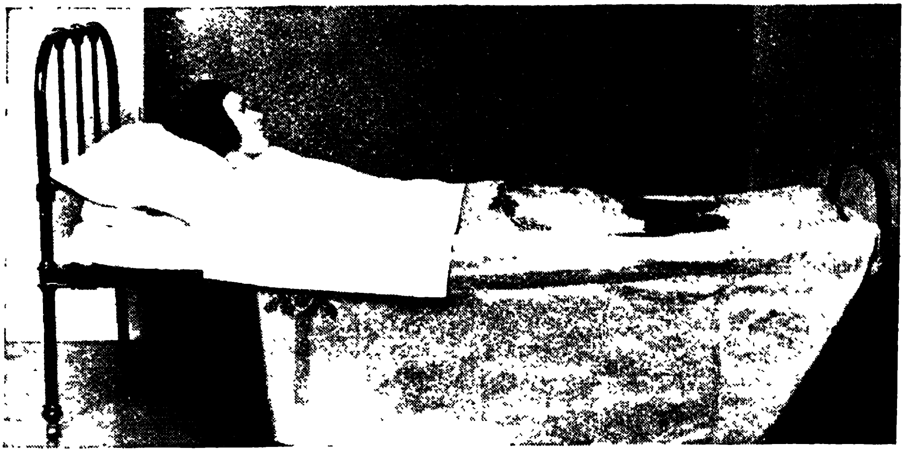
The Sickroom.—Ventilation is of prime importance, but draughts must be avoided. Windows, therefore, should be opened at the top and care taken when opening the door. The bed should not be placed in a direct line between the window and door or between the window and fireplace. An easily moved screen should be a part of the sickroom equipment and use made of it to protect the patient from draughts and glare.

The normal sickroom temperature is 60° F. and in winter this should be maintained by fires or radiators even though the window be slightly open.

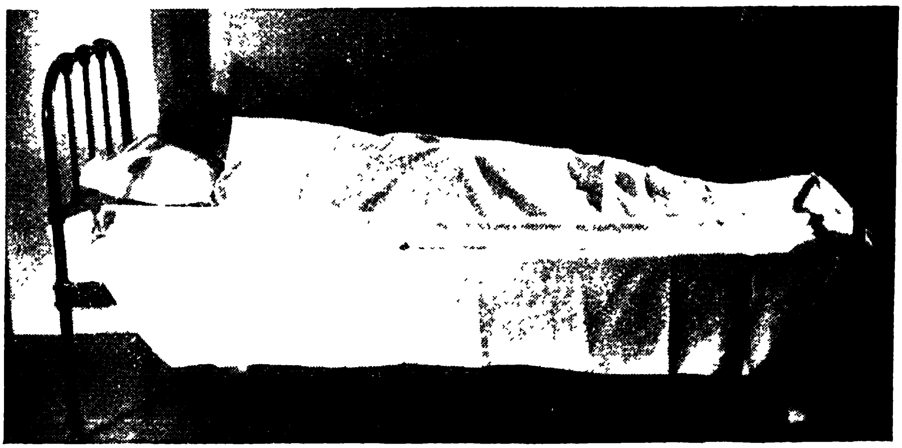
All utensils should be covered with a cloth, emptied immediately after use and brought back clean.

The sickroom should be quiet. The nurse should not wear creaking shoes or rustling

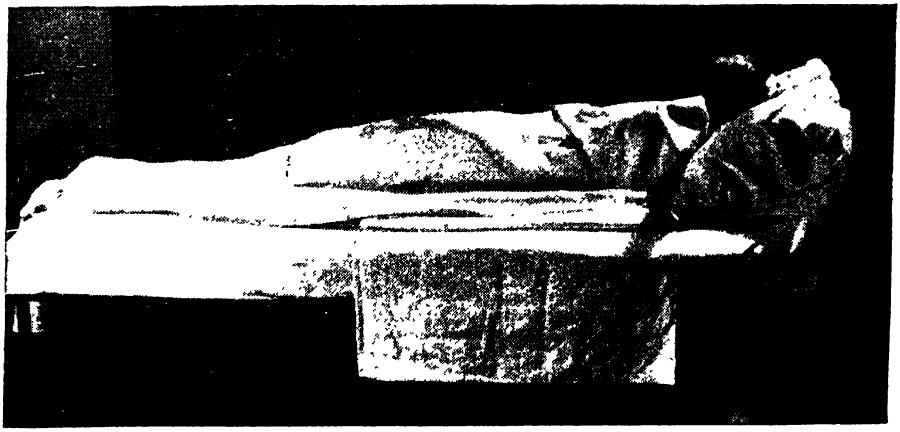
CHANGING SHEETS



Patient lying in bed.



Patient turned on side, sheets rolled against her back.



Patient turned on other side and sheet-rolls pulled through beneath her to be spread out.

garments. She should speak in a low distinct voice. Whispering in a sick room only irritates the patient. Noise should be avoided by every possible means. If a coal fire is used, the metal scuttle may be replaced by a basket and the poker by a wooden stick.

Superflucus furniture is better out of the way. The cleaning and tidying of the room is thereby simplified.

When on duty and not otherwise occupied the nurse should sit within the view of the patient, who is re-assured by the knowledge of her presence.

A narrow bed is easier to manage than a wide one.

Changing Sheets.—The easiest way to change sheets is as follows:

Get the patient over to one side of the bed and roll up the soiled sheet until it reaches the patient's side. Replace the rolled up portion with a clean sheet previously similarly rolled. Transfer the patient on to the clean portion. Roll off the rest of the soiled sheet and unroll the clean one to replace it. Restore the patient to the middle of the bed.

A draw sheet is made by folding a large sheet lengthwise to one yard in width. It is then laid across the middle of the bed above a mackintosh and with one end reaching just to the side, where it is securely pinned. The surplus sheet is formed into a roll at the other side and can be unfolded as the sheet is drawn over. This sheet must be very firmly pinned in place so as not to ruck and bother the patient.

Isolation.—When one member of the family falls ill with any contagious disease every care must be taken to prevent the disease spreading.

The patient should be placed in such an upper room as can best be isolated from the rest of the house and where the ventilation is good. Curtain, carpets, superfluous furniture and draperies should be removed, and a bath containing 1 pint of carbolic acid to 5 gallons of water be provided to receive all soiled personal or bed linen immediately such is changed.

The attendant should wear a loose overall and cap. On leaving the room she should discard these and wash her hands carefully with carbolic soap and hot water.

All feeding vessels, crockery, and cutlery used by the patient must be washed at once in antiseptic solutions, and all excretions from the patient's body disinfected at once with carbolic acid or mercuric chloride.

A sheet soaked in carbolic acid solution (1 pint to 2 gallons) may be hung in the landing outside the sickroom door.

If possible the nurse should previously have had the particular illness and be thereby wholly or partially immune.

Disinfection.—To disinfect the room after the illness scrub the walls, floor, and furniture with carbolic soap. Then paste strips of paper over the fireplace and windows, put a kettle on to boil on a small stove to supply steam, and light some stick sulphur—allowing 1 lb. of sulphur for every 1,000 cubic feet of room space. Close and seal up the door. Methylated may be used to start the sulphur burning and the room should be left unopened for at least 24 hours. Any brass fittings in the room which cannot be removed should be thoroughly disinfected and then covered with tissue paper or wax, as the sulphur fumes will badly tarnish them if left exposed.

Formalin is a more suitable disinfectant than sulphur, but its use calls for special apparatus. As a rule the local Health Officer, if asked, will arrange to have the disinfection done by his department free of charge.

Enema.—It is sometimes necessary to cause an evacuation by introducing medicine into the lower bowel. The procedure is as follows:—

The patient lies on his left side with the buttocks overhanging the edge of the bed. The pillow is withdrawn so that the head may lie low and is doubled up underneath the hips to give these the necessary height. A waterproof sheet should be laid over the bedding. A three-inch nozzle, which is first vaselined, is gently introduced into the rectum, and the soapy water—or other enema—is made to enter slowly. If it flows back the buttocks must be held against the nozzle. There is a natural tendency to expel the solution at once, so the patient should be warned of this and told to try to retain the enema as long as possible. A suitable pan must be at hand for the evacuation.

Poultices.—Like a fomentation the object of a poultice is to relieve pain and reduce inflammation. A poultice should always be larger than the affected area and should be an even thickness of ½–1 inch throughout.

Bread Poultice.—This is an old-fashioned, but effective, remedy for a festered finger or any other "gathered" sore.

Soak 2 oz. of stale bread-crumbs into ½-pint of boiling water for 2 minutes. Lightly press out the excess of water and spread the bread pulp on a piece of muslin or old linen. Cover with a piece of gauze, apply hot, and wrap in a clean outer cloth. (*See also* BEDSORE; ENEMA; FOMENTATION; POULTICES.)

SIDEROSIS.—A type of lung disease due to the inhalation of tiny particles of metal by metal workers. (*See also* ANTHRACOSIS; LUNG.)

SIGHT, ERRORS IN, or ASTHENOPIA.—In general use the word is only used to mean want of power to use the eyes for any sustained effort of vision. A person who is asthenopic is unable to enjoy full use of his eyes, because any attempt to gaze fixedly at anything is accompanied by more or less wobbling or dimness of the sight. It is especially noticeable in using the eyes for near work. Complaints made by sufferers vary so very much that no attempt can be made to give them in detail.

The causes of weak eyesight are chiefly: (1) Errors in sight, especially long-sightedness; (2) Muscular, which are probably due to fatigue of the nerves controlling the muscles of the eyes; (3) Nervous, in which the greatest variety of symptoms are found, and which may render the slightest and most ordinary use of the eyes painful or troublesome in some way. Frequently one or more of these causes are combined, but in any case of weak sight the nervous element should be borne in mind.

Treatment.—The treatment of asthenopia is to treat the cause. Glasses should be prescribed if they are found necessary; alcohol, tobacco, tea, and coffee may have to be forbidden; the general health should be regulated with tonics, if necessary.

The headache so often complained of generally disappears with the above treatment. If, however, it persists, showing that it is really a nervous headache, electric treatment may be tried, and eye-drops obtained from the doctor.

Astigmatism.—This is a common error of eyesight due to the cornea (the clear membrane in front of the eye) being unequally curved in different directions, so that rays of light in different meridians cannot be brought to focus on the retina except by continued and irregular strain of the muscle. The condition causes objects to seem distorted and out of place; a ball, for instance, will be egg-shaped.

It is rare to find an eye that shows no sign of astigmatism, but slight degrees cause so little discomfort that they are generally disregraded. In more severe cases the distress caused by the continued strain may be readily understood. Astigmatism may be remedied by suitable spectacles, in which one surface forms part of a cylinder. (*See also* EYE; SPECTACLES.)

Short Sight (Myopia).—In this condition, sometimes called long-eye, the distance from the lens to the retina is too great, so that distant objects are focussed in front of the retina and seem blurred. Near objects, however, can be seen more clearly and easily than with normal eyes. The handwriting and sewing of short-sighted people tends to be exceptionally small and neat. The condition is uncommon in young children, but sometimes comes on at school, especially if books are in small print and the light bad. Undernourishment and debilitating diseases, such as measles and tuberculosis, also cause short sight. (*See also* EYES; SPECTACLES; SQUINT.)

SIGMOID FLEXURE.—The S-shaped bend in the colon or large bowel is sometimes referred to as the sigmoid flexure. (*See also* INTESTINE.)

SILICOSIS.—This disease is a form of fibrosis of the lungs and is due to the inhalation of particles of dust. (*See also* ANTHRACOSIS; FIBROSIS; OCCUPATIONAL DISEASES.)

SILVER.—The most common preparation of silver used in medicine is nitrate of silver, or lunar caustic, which is chiefly used to destroy warts or small growths, etc. Weak solutions of the nitrate will sometimes relieve itching, and it may be applied to bed sores, or in cases of chronic pharyngitis or laryngitis and in certain eye conditions. Lunar caustic is the solid form of silver nitrate and it is usually prepared in the form of a short stick and fitted into a holder with a screw-on cover. When applied to warts, etc., it leaves a brownish stain on the skin. Silver salts are not much used internally because of the staining of the skin which produces the condition known as argyria. Other prepara-

tions are made from silver oxide and from colloidal silver. (*See also* ARGYRIA; LUNAR CAUSTIC.)

SINEW.—This is another name for a tendon. (*See also* TENDON.)

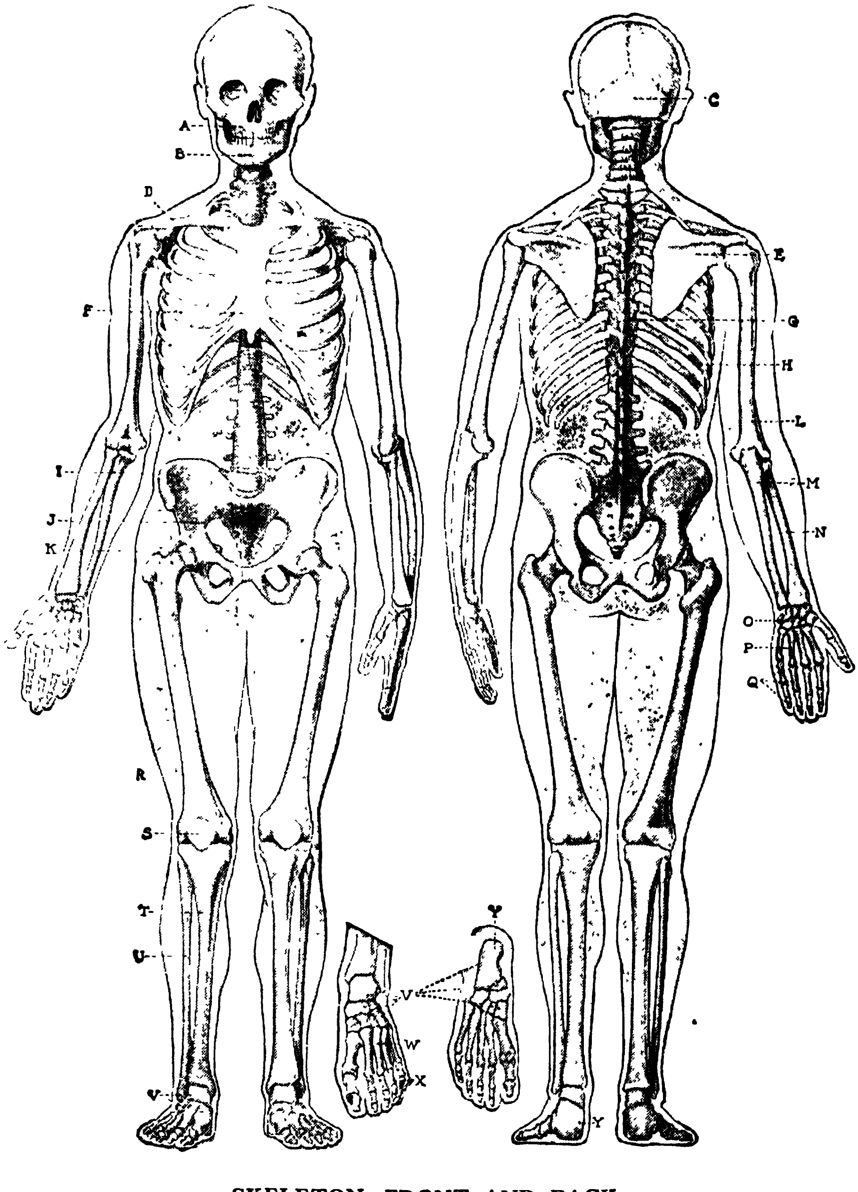
SINUS.—A sinus is a hollow or cavity, and the term is applied medically to a suppurating tract that has not healed up (such as a sinus leading from an abscess to the skin), but also to large channels containing blood (especially the venous sinuses of the brain, such as the lateral sinus), and to cavities within a bone (such as the maxillary and frontal accessory sinuses of the nose). *Sinus disease* is a term which is popularly applied to infection of one or more of the accessory sinuses of the nose (maxillary sinus or antrum, frontal sinus, ethmoid sinus, and sphenoid sinus), which are situated in the bones adjacent to the nose and communicate with it, containing air. The condition commonly follows influenza, though maxillary sinus infection may sometimes be caused by a tooth abscess. The treatment is usually surgical, though recently a successful medical treatment called "displacement" has been introduced by an American specialist, Proetz, by which antiseptic oils or other liquid are introduced into the sinuses by a suction apparatus which draws out the air in them, to be "displaced" by the antiseptic fluid. This is more successful in recent cases than in old chronic ones.

"SIX-O-SIX."—*See* SALVARSAN.

SKELETON is the bony framework that supports the soft parts of the body; in some parts of the body, such as the larynx and the ends of the ribs next to the breast-bone, the framework is of cartilage, not bone; but all of the bones originally developed from cartilage in early life. There are over 200 bones in the human skeleton, which is divided into the *axial skeleton*, including the skull, spinal column, ribs, and breast-bone, and the *appendicular skeleton*, including the bones of the arms and the legs.

SKIN.—The skin is made up of two layers, the epidermis, which covers the surface, and the dermis or "true skin" underneath. Below the true skin is the subcutaneous or "under-skin" layer, which is a loose tissue containing fat, blood-vessels, and nerves, and serves to protect the deeper structures underneath, and to give roundness to the body. The *epidermis* is composed of closely-packed cells. The deeper layers are soft, and are constantly increasing in number and size. The cells thus formed are gradually pushed up to the surface by other new ones forming below. They are gradually cut off from their source of nourishment, shrivel, become dry and horny, and are shed or rubbed off when they reach the surface. This horny layer is especially thick on the palms and soles. The *dermis* or true skin is composed of a dense tough material called connective tissue. It contains many elastic fibres, tiny blood-vessels, and nerves. None of the blood-vessels actually reaches the epidermis, but they allow nourishment to soak through, as it were, to supply its growing layer. The outer surface of the dermis is not flat; but has a "hill and valley" arrangement. Each "hill" is called a papilla, and contains a little loop of tiny blood-vessels, called capillaries, which supply the epidermis, hairs, and nails with nourishment. Some of the papillæ also contain a tiny oval body attached to a nerve fibre; these provide the sense of touch. Some of the nerve fibres enter the epidermis.

The surface of the epidermis is raised up into ridges. These are especially well seen in the tips of the fingers, where they are arranged in arches, circles, or loops. It is common knowledge that no two people have the same pattern, so that finger-prints, as they are called, are largely used for purposes of identification. If the ridges are magnified it will be seen that they are perforated by a large number of tiny holes. Each of these is the mouth of a *sweat gland* or coil gland. The duct or "drain" passes in a twisting manner—rather like a cork-screw—back into the true skin, where it rolls up into a little coil, which is the sweat-gland itself. They are found on the skin all over the body, including the scalp, but are most numerous on certain parts of the body, the palms, the soles, the armpits, and the space between the buttocks. It has been calculated that, allowing ¼-inch for each gland and its duct, the skin contains something over two million glands, the length of which would be about eight miles! *Sebaceous glands*, which are always in close relation to a hair, produce an oil which lubricates the hair and keeps it glossy; they also lubricate the surrounding skin. They are found wherever there is hair, i.e. all over



SKELETON, FRONT AND BACK

A Maxilla
B Mandible
C Occipital Bone
D Clavicle
E Scapula
F Sternum
G Vertebræ
H Ribs

I Pelvis
J Sacrum
K Coccyx
L Humerus
M Ulna
N Radius
O Carpus (8)
P Metacarpus
Q Phalanges

R Femur
S Patella
T Tibia
U Fibula
V Tarsus
W Metatarsus
X Phalanges
Y Os Calcis

the body, except on the palms and soles. Their action is seen especially on the scalp. If they produce too much oil, the hair becomes greasy and scurfy; if too little, it is dull and dry. *Hairs* are made up of horny matter formed in the epidermis. Each hair grows from a little pit in the horny layer of the skin called a hair follicle, into the base of which enters a papilla of blood-vessels, which nourishes the root of the hair. Hair is of two varieties: the coarser kind that grows on the scalp and in other situations, and the lanugo or downy growth which forms an almost complete though practically invisible covering for the body. Each hair has its own small muscle, which by contracting, can cause the hair to "stand on end." The *nails* also grow from the epidermis, by some of the horny cells in certain situations called "nail-beds," not falling off, but becoming closely pressed together. The nail-bed itself is formed by the true skin, and is nourished by the blood-vessels there. It has no concern in the growth of the nail. The cells grow quickly, and the nail is simply pushed along the nail-bed by its growth from behind.

The skin possesses three important functions, namely, protection, regulation of temperature and excretion. The horny layer of the skin is very resistant to chemical and other substances; the fat and wax with which the cells are supplied, and which the sebaceous and sweat glands pour out upon the body, not only provide it with a waterproof covering, but prevent too much water leaving the body. When this protective greasy covering is removed, disease germs can grow quickly and make their way into the damaged skin. The pigment of the skin, which is found in differing amounts in different people and races, is a complex substance called melanin. It is found in small brown granules, and occurs in certain cells in the epidermis. If the skin is exposed to sunlight, or X-rays, or sometimes in chronic skin disease, more melanin is produced, and freckles, bronzing, or pigmented patches result. The pigment and the horny layer, then, protect the body (including the deeper structures) from the injurious effects of too much light.

The skin acts as an adjuster of temperature by the dilatation and contraction of the skin vessels, and by the action of the sweat glands. These are in action the whole time extracting waste products from the blood-vessels which surround them, and passing it out to the surface. The skin is thus a most important organ of excretion. Most of the sweat evaporates without being visible (insensible perspiration). In hot weather or during strenuous exercise sweat is excreted too rapidly for evaporation to keep pace with it, and drops of moisture are seen (sensible perspiration). The sweat consists chiefly of water, with salt, fats and fatty acids, and some waste matters. About one-and-a-half pints is lost daily by insensible perspiration; during exercise the amount may be far greater. The body is always working, and work produces heat. The sweat, which evaporates from the surface, causes the required amount of heat to be lost. In cold weather sweating is less, in hot or during exercise it is more, so that the temperature of the body (in health) neither rises nor falls beyond a very little. The activity of the sweat glands is influenced by the nervous system. Shame, nervousness, and fear, for instance, all increase sweating. This is usually associated with flushing, i.e. increased blood-flow to the skin; but pallor and a "cold sweat," during which little blood passes to the skin, are also observed. (For Inflammation of the Skin *see also* DERMATITIS *and* SKIN, DISEASES OF.)

SKIN, DISEASES OF. Inflammation of the skin (*dermatitis*) attacks every part of the body, and it is possible, though not probable, to find the different forms on every part at different times. Certain forms, however, have a fondness for certain regions, and these are discussed under separate headings. (*See also* ACNE-ROSACEA; CHEILITIS; DERMATITIS; ECZEMA; FROST-BITE; HEAD LOUSE; INTERTRIGO; LUPUS; PAGET'S DISEASE; PELLAGRA; PSORIASIS; RINGWORM; SCABIES; SEBORRHŒA; SUMMER PRURIGO; XERODERMA.)

SKULL.—The skull is the bony framework of the head, and is divided into two parts—the cranium and the face. The cranium encloses the brain and is made up of the occipital, frontal, two parietal, two temporal, and ethmoid and splenoid bones. The bones of the face comprise the two upper jaw-bones (superior maxillæ) and one lower jaw-bone (inferior maxilla), two malar, two

nasal, two lachrymal, two turbinal, two palate bones, and the vomer.

SLEEP.—Work and sleep are the natural occupations of day and night in turn. Healthy babies sleep most of the time, only waking for food. Little children should be put to bed once or twice during the day. Older children, at school, need ten hours' sleep. The quality of sleep is of at least as great importance as its quantity.



Skull

In later life the amount of sleep required depends largely on the individual. Some quite old people doze a good deal, though merely elderly ones often take only a few hours' sleep. Sleeplessness — insomnia —should not be allowed to continue; medical advice should be obtained. Sleep-walking—somnambulism—when only part of the brain is asleep, needs special care. Children who walk in their sleep are probably highly sensitive, and of excitable temperament. Never make fun of a child who walks in its sleep. If possible, lead it gently back to bed without waking it; if it must be wakened, the process should be as quiet and gradual as possible. (*See also* INSOMNIA; SLEEP-WALKING.)

SLEEP-WALKING or somnambulism is really the acting of a dream. It occurs most commonly in people who are the victims of hysteria and is looked upon as one of the symptoms of that disorder. It may also be produced during hypnosis (*see also* HYPNOTISM) in which state the patient can be asked to dream and to act his dream, which he will do with remarkable dramatic powers. As a rule, sleep-walkers do not wander very far and they are usually able to take care of themselves. The case of a sleep-walker falling and killing him- or herself is exceptionally rare. The dream that is acted depends on what particular dream material has risen into the patient's consciousness and taken sufficient hold of the personality for it to be so enacted. Very often the movements and actions carried out during a fit of sleep-walking are representations of episodes which have been forgotten by the patient in the waking state, but have lain buried in the sub-conscious mind (*see also* MIND) and have risen up during sleep to force themselves upon the patient's notice. It is rare for the subjects of sleep-walking to remember their actions when they awake, but sometimes they have a distorted memory of what has happened to them. The distortion usually consists in that they remember some of their actions simply as a dream, not as an event in which they took part. (*See also* HYSTERIA.)

SLEEPING SICKNESS.—This disease is also known as trypanosomiasis, and it is caused by the bite of the tsetse fly. It occurs amongst the natives of Africa' and it is often described as African lethargy or negro lethargy. There are two types of the disease found in Africa, but there is also another type found in Brazil called American trypanosomiasis, or Chagas's disease. The parasite, or germ, which causes the disease, settles in the blood-vessels of many animals, especially cattle, etc., and it is through biting these infected animals that the tsetse fly becomes so dangerous.

Symptoms.—Some people begin to show symptoms two or three weeks from the time of being bitten, while others again do not show any sign of the disease for several months. The small puncture in the skin made by the bite, may or may not feel irritable, and unless some redness shows the patient may overlook the affair. The first stage commences with fever, and the temperature in the evening is usually higher than in the morning. The fever may come and go during the first few weeks, but gradually it becomes more pronounced, and in time the patient becomes weakened and anæmic. The glands of the neck and other parts of the body become swollen, and there may be a rash of pink ring-shaped patches over certain areas of the skin. In negroes, instead of the rash, the skin may be dry and scaly. The next stage in the condition is where the symptoms of sleeping sickness begin to show themselves. The patient becomes careless in his work and in his habits, his walk becomes a slouch, and he tends to

fall asleep on all occasions. There are tremors of the tongue and hands and he may complain of dull headache in his wakeful moments. He will eat food if it is brought to him, but very often the effort of raising food to the mouth is too much for the patient. Gradually he becomes very thin and wasted in appearance, and he may die of sheer exhaustion unless carried off earlier by some other condition.

Treatment.—The best form of treatment is the new drug known as Bayer 205, and in the earlier stages of the disease it is sometimes possible to effect a cure. Among other substances which have been used with favourable results are atoxyl, soamin, arsacetin, salvarsan and tartar emetic.

SLEEPLESSNESS.—Insomnia is another term for sleeplessness. (*See also* INSOMNIA.)

SLEEPY SICKNESS.—This condition is in no way related to the disease known as *sleeping sickness*; the medical term for sleepy sickness is *encephalitis lethargica* (*See also* ENCEPHALITIS.)

SLING.—A bandage for the support of a limb is known as a sling. (*See also* BANDAGE.)

SLOUGH.—Sloughing of the tissue occurs when a dead part becomes separated from the living tissue. For example, the "core" which appears in the centre of a boil or abscess is known as a slough. Sloughs may be of a very small size, or they may include a whole limb as in gangrene. (*See also* GANGRENE; NECROSIS.)

SMALLPOX.—Smallpox, or variola as it is also called, is an infectious disease, the chief symptoms of which are fever and an eruption of the skin. The cause of the disease is believed to be due to a very tiny germ, but what is definitely known is that smallpox is one of the most contagious of all diseases. The infection is spread by the breath of the patient and by contact with him or his personal belongings. The infection can also be carried by the clothes of third persons not themselves infected, and it is believed that the germs can be carried through the air for some considerable distance.

Symptoms.—About twelve days after the infection, the disease begins with an attack of shivering, headache, pains in the back, and vomiting. In children there may be convulsions. On the third day, the fever declines a little and a rash, somewhat resembling that of scarlet fever, makes its appearance. It commences on the face and head, spreads to the arms and trunk, and lastly appears on the legs. The distribution of the rash is important and it is one of the points of value to the doctor when he is making his diagnosis. During the period between the third and sixth day the rash undergoes a change in appearance, the raised "pocks" become filled with a clear fluid and in the centre there is a slight depression. On about the eighth day these vesicles or blebs become larger in size and the fluid inside them changes into pus or yellow matter. The skin surrounding each "pustule" is inflamed and swollen, and as the eruption is more thickly spread on the features become very disfigured indeed.

The eruption is present on the mucous membranes as well, particularly in the mouth and throat, and the inflammation and swelling which takes place is often a serious matter to the patient as there is great danger of obstruction of the air passages. The fever which had somewhat declined after the first two days now makes its appearance again (secondary or suppurative fever), and the patient is extremely restless from the irritation caused by the rash. On the eleventh or twelfth day the pustules either break or dry up and blackish crusts form. The temperature usually drops at this stage, but there is great itching of the skin where a scab has formed over each pustule. The scabs gradually fall off leaving a scar or "pit" which is one of the characteristic marks of smallpox.

The symptoms just described are those met with in an ordinary case of smallpox, but in some outbreaks the type of the disease is much more severe. The course of the disease may be interrupted by dangerous complications, the chief of which affect the lungs, throat, eyes and ears. In the type of the disease known as *confluent smallpox* the symptoms are much more severe from the very onset, and the rash, instead of showing itself in isolated spots, appears in large patches, and the pocks are so numerous that they run into one another. Many of these cases prove fatal, while in those that survive, convalescence is a very prolonged affair and the scars left on the face are extremely disfiguring. An even more severe type of the disease is the *hæmorrhagic* type in which

bleeding takes place into the pocks after they are formed. *Discrete smallpox* is the term used to describe mild cases, and *varioloid* cases are those in which the symptoms are very slight. This last type may occur in persons who have had a previous attack of smallpox or who have been inoculated or vaccinated against it.

Treatment.—The general treatment of smallpox is conducted along the same lines as for any other infectious disease. The patient is removed to hospital, which is usually situated some distance from a town. All those who have been in contact with the patient are vaccinated, and the public health authorities keep a very strict watch in order to check any spread of the infection. The house and clothing must be thoroughly disinfected. The patient should lie in a well-ventilated room, and one form of treatment allows only red light to be admitted to the room in order to protect the skin from the chemical rays of light, and thereby lessen the subsequent facial disfigurement from pitting. Skilled nursing is of vast importance in this disease and the patient must be kept strictly isolated until the skin is thoroughly healed. The length of time in hospital is usually about eight weeks. (*See also* INFECTIOUS DISEASES.)

SMELL.—The organ of smell is in the specialized lining membrane of the nose and it is more highly developed in the lower animals than in man. The loss of the sense of smell is termed anosmia, and it may be due to a variety of diseases or injuries. In some mental disorders, it may be diminished or lost and sometimes imaginary smells are experienced. The sense of smell is important to man because of its æsthetic value; the flavour of food is really a compound of taste and smell and the smell stimulates the gastric juices and aids digestion. (*See also* APPETITE; NOSE.)

SMELLING-SALTS.—These are usually made up of strong ammonia with various perfumes added to make the preparation more agreeable. The inhalation of the pungent vapour has a stimulating effect on the heart, and this method will be found useful for reviving people who are faint or have fainted, or for those suffering from shock or collapse. (*See also* AMMONIA.)

SMOKING.—*See* TOBACCO.

SNAKE BITE.—*See* BITES AND STINGS.

SNEEZING.—Any irritation in the nose may cause a fit of sneezing as this is Nature's way of getting rid of the irritation and infection. Sneezing is one of the symptoms of cold in the head, influenza, hay-fever, etc., and there may be watering of the eyes and running at the nose. A person who is subject to fits of sneezing should always carry and use a large handkerchief sprinkled with menthol. Unguarded sneezing is highly dangerous because of the germs which may be spread to those around. (*See also* CATARRH, NASAL; HAY FEVER; INFLUENZA.)

SNORING.—Snoring results from sleeping with the mouth open which causes the soft palate at the back of the throat to vibrate. Snoring in children is almost always due to the presence of adenoids. (*See also* ADENOIDS.)

SNOW BLINDNESS.—A condition of the eyes in which the conjunctiva becomes inflamed, through continuous gazing at large tracts of snow under a dazzling sun, is known as snow blindness. (*See also* BLINDNESS; CONJUNCTIVITIS.)

SNUFFLES.—Noisy breathing through the nose is a frequent accompaniment of a common cold, and occurs often in children who have adenoids. When this noisy breathing is heard in children of a few weeks old it is usually due to congenital syphilis causing an unhealthy condition in the nose. (*See also* ADENOIDS; SYPHILIS.)

SOAP.—Soap is a substance made up of a combination of a fat or oil and an alkali such as caustic soda, etc., which gives it greater cleansing power. Some laundry soaps are made with ammonia instead of soda. Yellow soap—which is used for general household purposes—is prepared by mixing hard fatty soap with resin soap. In soft soap, or green soap, caustic potash is used instead of soda, while curd soap has tallow for its fat. Marine soap is made with coconut oil, and it is specially prepared so that it can be used with sea water for washing purposes. Transparent soap is made by dissolving ordinary soap in alcohol which is distilled off and the soap is then allowed to cool and harden in the usual way. Glycerine added to melted hard soap forms a transparent soap with a very lasting lather. Medicated soaps may contain drugs such as carbolic acid, salicylic acid, camphor, iodine, mercury, sulphur and ichthyol, and these are recommended in

certain diseases of the skin. Toilet soaps are just ordinary soaps which are more or less purified, with perhaps the addition of some colouring matter and perfume. Soap with too much alkali in it may prove very irritating to the skin and in such cases a super-fatted soap should be used. Care should be taken to always use a good super-fatted soap on a baby's skin. Many toilet soaps are made with olive oil or almond oil. (*See also* CARE OF THE COMPLEXION in the SUPPLEMENT ON BEAUTY CULTURE.)

SODA.—This term is generally applied to bicarbonate of soda (baking soda) or to the carbonate of soda (washing soda). Soda water consists of water charged with carbonic acid gas and it contains a very small amount of sodium bicarbonate. (*See also* SODIUM.)

SODIUM.—Sodium is a soft metal the salts of which form many important and well-known substances. For example, sodium combined with chlorine gas forms common salt or sodium chloride; combined with carbonic acid it forms washing soda or sodium carbonate, and with carbonic acid and hydrogen it forms baking soda or sodium bicarbonate. Sodium bicarbonate, or baking soda, is largely used to relieve indigestion due to over-acidity of the stomach. The fluids of the body contain naturally a considerable quantity of sodium chloride, or common salt. (*See also* POTASSIUM; SALT.)

SOFTENING OF THE BRAIN is a term commonly applied to syphilis affecting the brain, or to suppuration of the brain due to brain abscess. It may signify interference with the nourishment of the brain through its blood supply. When a part of the brain is suddenly deprived of blood it ceases to be able to do its work properly, and in the case of a large area of the brain this means that serious consequences follow to health, if not to life. If a blood-vessel in the brain bursts, giving rise to hæmorrhage, it is unlikely that the patient will survive; if he does, some severe form of paralysis is almost certain to result. But a blood-vessel may become so narrowed by disease—such as arterio-sclerosis—that it closes up, again depriving the part of the brain supplied by that vessel of its proper nourishment, and in such a case, although serious paralysis may follow, especially a hemiplegia in many cases, yet the danger to life is not so great. Another cause of "softening of the brain" is destruction of the brain by a tumour. This condition is usually fatal, unless the tumour is in such a situation and of such a nature that it is removable by operation. (*See also* ARTERIO-SCLEROSIS; HEMIPLEGIA; PARALYSIS.)

SOFT PALATE.—The soft palate is the roof of the mouth at the back of the throat which is a muscular continuation of the bony arch forming the hard palate; it ends at the uvula. (*See also* PALATE.)

SOFT SORE.—Soft sore, or soft chancre, is a venereal ulceration which forms in the region of the groins. It is non-syphilitic, but it is often mistaken for the syphilitic hard chancre. (*See also* SYPHILIS.)

SOLAR PLEXUS.—The junction of a network of nerves connected with every organ within the abdomen is called the solar plexus or cœliac ganglion. This tangled mass of nerves is situated in the top of the abdomen behind the stomach and in front of the aorta. It is easy to understand that blows or other injuries to this part of the stomach may have serious consequences. (*See also* SYMPATHETIC NERVOUS SYSTEM.)

SOMNAMBULISM.—This is another name for sleep-walking. (*See also* SLEEP-WALKING.)

SOPORIFIC.—Any drug which tends to induce sleep is known as a soporific. (*See also* DRUGS; HYPNOTIC; NARCOTIC.)

SORDES.—This word is derived from a Latin word meaning foul, and it is used to describe the crusts which form on the gums and lips of patients suffering from extreme exhaustion. The condition is most commonly seen in those suffering from some acute fever, especially typhoid fever. At first the crusts are yellow in colour and they form a thin line on the lips and at the margin of the teeth. Gradually this line increases in thickness and size and it changes in colour from yellow to a brownish-black. The material is composed of particles of food, cells and bacteria. The lips and mouth should be carefully cleansed with a piece of soft material dipped in a mild antiseptic lotion such as weak potassium permanganate, glycerine of borax, peroxide of hydrogen, etc.

SORE.—This is a popular term for ulcer. (*See also* ULCER.)

SORE THROAT.—The majority of cases are due to infection with the common cold or influenza, or to septic tonsils. Diptheria may be mistaken for simple tonsillitis and on

this account a thorough examination should be made when a child complains of a pain in the throat; if there is any suspicion a doctor will always take a swab from the throat and will usually inject antitoxin as a safety measure, without waiting for the result of the bacteriological examination. Sore throat is also one of the earliest symptoms in scarlet fever. A troublesome cold may start off with a feeling of soreness and rawness in the throat, and pharyngitis and laryngitis may be exceedingly painful; the best treatment is two aspirin tablets every three hours and inhalations of Friars' balsam. A relaxed throat is a source of a good deal of discomfort, and it is quite common in people who are run down and need a holiday. Relief is best obtained by gargling with a hot solution of bicarbonate of soda or chlorate of potash and by painting the throat with a suitable paint such as the well-known Mandl's paint, which contains iodine in glycerine. (*See also* CLERGYMAN'S SORE THROAT; DIPHTHERIA; LARYNGITIS; PHARYNGITIS; TONSILLITIS.)

SORREL.—Two plants of this name are found in Great Britain and they both yield a certain amount of oxalic acid. The leaves of one variety of the plant are much used in sauces and salads. (*See also* OXALIC ACID.)

SOUR MILK.—Sour milk is used a great deal in the treatment of dyspeptic cases and gastric ulcer, etc. (*See also* LACTIC ACID.)

SOUTHEY'S TUBES.—These are very fine tubes used for drawing off water from the body in cases of dropsy. (*See also* DROPSY.)

SPANISH FLY.—This is a dried beetle which possesses strong blistering properties, and it is frequently used as a counter-irritant in cases of rheumatism, pleurisy, etc. (*See also* CANTHARIDES; COUNTER-IRRITANT.)

SPASM.—A convulsive movement or a painful contraction of the muscles is described as a spasm. Spasm may affect muscles in any part of the body, and it is not unusual to have a spasm of the muscles of the leg ("cramp"), especially when varicose veins are present. A spasm may be only a temporary attack or it may be more or less constant, or the attack may come in waves (clonic) or without any relaxed periods (tonic). There are general spasms of the whole body in such disorders as epilepsy, tetanus (lockjaw), strychnine poisoning, and hysteria. Some people suffer from facial spasm ("tic") in which the eye may be seen to twitch or other contortions may take place at intervals. These symptoms are usually due to some disorder of the nervous system. (*See also* HYSTERIA; NERVOUS SYSTEM; ST. VITUS'S DANCE.)

SPEAKER'S THROAT.—*See* CLERGYMAN'S SORE THROAT.

SPECIFIC.—A remedy which has the power to cure a disease is said to be specific for that disease. For example, quinine is a specific for malaria, digitalis for certain conditions of the heart, and salvarsan for syphilis. The term is also used as a description of a definite disease, and commonly as a euphemism for syphilis.

SPECTACLES.—In perfect eyes, images of external objects are focused exactly upon the retina. The eye has the power to accommodate itself for near and distant objects. In many cases, however, the eyes are in some way defective; in *long sight* the image is focused beyond, and in *short sight* before the retina. In **astigmatism**, a distorted image is produced. In middle life, **presbyopia** occurs, and it becomes increasingly difficult to focus near objects. The ill-effects of these conditions may be removed by the use of suitable spectacles. These should always be prescribed by a specialist in eye diseases, not at a spectacle shop. Protective spectacles may be of coloured glass, which protects the eyes against excessive light, e.g. the sun, an eclipse, or high-power electric lights; or motor-goggles, which protect from dust and wind; or wire spectacles, which are used in such work as stone-breaking, hedge-cutting, etc., to protect from flying chips.

SPEECH.—For the perfect performance of speech a most complicated series of happenings must take place. First of all, those parts of the brain which control the vocal powers of communication must be healthy. The development of these parts of the brain in the child and the loss of speech caused by their damage or destruction is fully dealt with under APHASIAL. If this central apparatus for controlling speech is diseased, then no matter whether the rest of the apparatus involved in production of speech is healthy or no, speech is either lost or imperfect. The rest of the speech-producing apparatus consists of the tongue, the lips, the vocal cords, which are in the throat, and the palate. If the nerves to any of these struc-

tures are damaged, either by pressure from other structures or by disease of the nerves themselves, then speech is altered in character or may be entirely lost, but loss of speech in such a case differs from a loss of speech due to damage to the central brain apparatus in that intelligent sounds can be whispered, a condition which is called *Aphonia* to distinguish it from *Aphasia*, where the central apparatus is damaged.

There are a large number of different causes of aphonia. The most important being due to hysteria, and this form of aphonia rapidly recovers when the hysteria is treated. Treatment of the aphonia alone is of no value. Pressure on the nerves which control the movements of the vocal cords is a common cause of aphonia. The pressure may be either from a tumour in the upper part of the chest, or from an aneurysm or from an enlarged thyroid gland in the neck. In any of these conditions, before the voice is lost, there is a period in which the voice alters and becomes somewhat harsh, and usually there is a harsh "brassy" cough as well. Another, fortunately rare, condition in which the voice first becomes altered in character and then is lost, is progressive muscular atrophy. In this condition the voice takes on a nasal quality, as if one were trying to talk with the nose held tightly; later, there is difficulty in moving the lips and tongue to form words, and finally any attempts at speech are hopeless. In diphtheria, when there is a neuritis of the nerves controlling palate, speech becomes altered and also becomes very nasal, but with recovery from the neuritis the voice returns. It is possible to recognize certain diseases of the nervous system as soon as the patient opens his mouth, because the type of speech he utters is quite characteristic.

This is the case in "G.P.I." in which the words are slurred over and uncompleted, whilst whole syllables may be chopped off. Test words often used because of the difficulty patients with general paralysis have in pronouncing them are "constitutional" and "constabulary." Another disease in which the speech is characteristic in its later stages is disseminated sclerosis. In this disorder each syllable is uttered separately and the syllables are separated by considerable pauses. Patients who suffer from disseminated sclerosis make six syllables of the word "Extraordinary," saying "Ex-tra-or-din-ar-y," with pauses between each syllable. In some cases of old age, in which there are changes in the blood-vessels of the brain, speech is much disturbed, the disturbance finding expression in constant repetition of one phrase which the patient hears said to him. This phrase may be his sole output of speech, or he may use the phrase till he tires of it, and then no more. (*See also* ANEURYSM; APHASIA; DISSEMINATED SCLEROSIS; G.P.I.; HYSTERIA; NEURITIS; PROGRESSIVE MUSCULAR ATROPHY.)

SPERMACETI.—This is a solid, fatty substance which is obtained from the sperm whale. It is largely used as a basis for ointments and for many cosmetic preparations such as cold creams. (*See also* COLD CREAM; BEAUTY CULTURE.)

SPERMATIC CORD.—This structure is made up of arteries, veins, nerves, etc., which are associated with the testicle. Twisting of this cord causes strangulation of the blood-vessels, and, if immediate treatment is not carried out, gangrene usually sets in and the testicle and cord may have to be removed by operation. The veins of the spermatic cord may become varicose and the condition is called a varicocele.

SPERMATORRHŒA.—This term is applied to the involuntary discharge of semen from the urethra in the male without any sexual excitement. People who live a continent life are liable to become worried and depressed over these discharges, and may even become neurasthenic. The condition is normal if the discharges are not too frequent, otherwise a doctor should be consulted, who will probably prescribe a sedative mixture. The most common causes are due to such conditions as constipation, irritation of the sexual organs by walking or riding, varicose veins, a long foreskin, intestinal worms, or reading exciting or pornographical literature before retiring to bed.

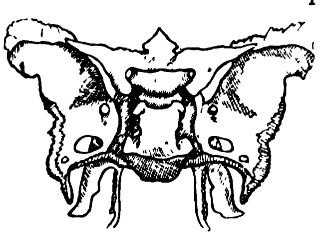
Treatment.—Consists in removing the cause once it has been discovered. Cold baths, suitable exercise, and often a change of surroundings or companions will help considerably. A soothing mixture containing bromide taken before going to bed will often give a night free from symptoms.

SPERMATOZOON.—The human male germ which is able to fertilize the female

ovum, or egg, is known as a spermatozoon. It is microscopical in size but consists of a head, a neck, a body and a tail. The tail is by far the longest part and acts as a powerful propeller which makes the tiny cell capable of active movement. These cells are able to live for quite a few days if kept at body temperature, but they soon die if exposed to the cold. (*See also* SEMEN.)

SPHAGNUM MOSS.—Pads of sphagnum moss, consisting of the stumps and leaves of various bog mosses which are cleaned and dried, are used as a substitute for cotton-wool. The moss is very absorbent and it is useful for dressings and accouchement sheets, and for other similar purposes. (*See also* COTTON-WOOL.)

SPHENOID BONE.—This bone lies at the base of the skull and in shape it bears a close resemblance to a bird. It consists of a hollow central part or body from which arises thin structures on either side known as the great wings. The hollow in the central part communicates with the nose and is called the sphenoidal sinus. (*See also* BONE.)



Sphenoid Bone

SPHINCTER.—This term is applied to any round muscle which encircles the opening of a hollow organ. There are many such structures in the body, but the three chief ones are the sphincter of the anus, that of the bladder, and the one that surrounds the opening of the stomach into the duodenum. Certain nerves control the movements of these muscles causing them to contract, thus preventing the escape of the contents of the organ. In some diseases of the nervous system this action is interfered with, so that the power to relax or contract is lost, and escape or retention of the contents may have troublesome results. (*See also* ANUS; BLADDER; DUODENUM.)

SPHYGMOGRAPH.—This is an instrument for recording the movements of the pulse. The name sphygmomanometer is given to an instrument which is able to measure the blood-pressure in arteries. (*See also* articles on BLOOD-PRESSURE; PULSE.)

SPICA BANDAGE.—*See* BANDAGE.

SPINA BIFIDA.—This term means literally a cleft spine and it aptly describes the condition. In the early days of growth, the spinal cord is represented by a groove along the back of the child while it is still in the mother's womb. The borders of this groove grow together and form a tube which is the central canal of the spinal cord. It is easy to see that if this tube fails to develop, the child will be born with the spinal cord open to the surface of the back. In such a case the child will probably be stillborn. Sometimes the neural tube has closed and the spinal cord is more or less perfectly formed but the outer covering of tissue may have failed to grow and enclose it, and the child is said to be born with split spine, or spina bifida. The usual appearance in this condition is a swelling in the lower part of the spine which contains cerebro-spinal fluid. The treatment of the condition is surgical and many cases have been successfully operated upon. (*See also* SPINAL CORD.)

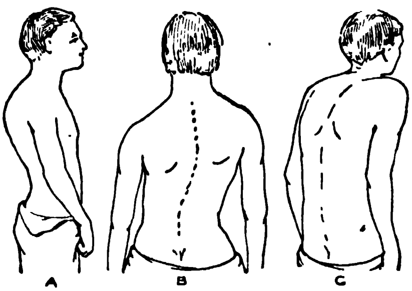
SPINAL COLUMN.—The spinal column is also known as the spine, the backbone, or the vertebral column and it forms a very important part of the skeleton. (*See also* BACKBONE.)

SPINAL CORD is a part of the nervous system which is directly continuous above with the medulla (q.v.) and extends downwards as far as the lower part of the loins. It is contained in a bony canal—the spinal canal, which is enclosed by the vertebral column. The spinal cord is enclosed by the same three membranes as envelop the brain. It gives off the spinal nerves, which pass out through spaces in the vertebral column to form the nerves to the limbs, trunk, and internal organs. The spinal cord is divided into five regions, the cervical (neck), the dorsal (trunk), the lumbar (loin) the sacral, and the coccygeal regions. There is an enlargement of the cord in the cervical region where the nerves to the arms are given off, and another in the lumbar region where those to the legs leave the cord. The internal structure of the spinal cord is very complicated. It is divided into two lateral halves by a bridge of tissue. Each lateral half is made up of a central portion of grey matter, enclosed by an outer portion of white matter. The grey matter contains areas which are called anterior and posterior horns. In the

anterior horn are very large important nerve cells, which are motor nerve cells and are concerned with movement of groups of muscles. In the white matter are the nerve fibres which conduct messages either to the brain from the various organs and the muscles and skin and those which carry messages from the brain to these parts. In fact, the white matter is the pathway to and from the brain. But in addition, certain involuntary movements called reflexes result from nervous action in the spinal cord without any intervention of the brain and without an individual being conscious that they have occurred. (*See also* BRAIN; NERVOUS SYSTEM; REFLEXES.)

SPINAL CURVATURE.—Deformity of the backbone consists of an exaggeration of its normal curves, or a new curve may form in a lateral or sideways direction. *Kyphosis*, commonly known as round shoulders, is described under its own heading, and *lordosis*, which is an increase of the forward curve in the small of the back, is also described under its own heading. *Scoliosis*, which is the name given to a sideways curve of the spine, may be due to rickets in early childhood, to tuberculosis of the hip, or to great muscular weakness. In young growing children the habit of standing badly is very liable to lead to curvature of the spine. Diseases of the chest, such as pleurisy, in which the chest becomes collapsed, are also liable to cause an alteration in the shape of the spine. The treatment of these conditions consists in keeping the general health in as good condition as possible by means of fresh air, suitable exercise, good food, and tonics if necessary. Special exercises should be practised daily, and any habit of standing or sitting badly should be avoided. Growing children should never be allowed to carry heavy weights. It is only in extremely marked cases that special mechanical supports are necessary, but massage is good as it helps to strengthen the muscles of the back.

Spinal Column: Showing Vertebræ



Spinal Curvature: A—Kyphosis and Lordosis; B—Scoliosis; C—Spondylitis deformans

Angular curvature of the spine, which is also known as *Pott's disease*, is a much more serious condition, and it is almost always caused by tuberculosis. The deformity in this condition is due to caries or rotting of the vertebræ, and, as the bone is destroyed, the spine gives way at the site of the disease thus causing a sharp curve forward. A similar condition may occur as the result of a fall in the case of a young child, or a severe blow upon the back of an older person. Deformity of the spine does not begin to appear until quite late in the disease. The first symptom is dull, aching and constant pain in the back which is increased by sudden movement or by jarring of the spine. In order to avoid pain, the back is held very stiff and rigid and this attitude is one of the characteristics of the disease. On being requested to bend down it is found that the spine tends to move as a whole, and a child will crouch down, bending his knees while still maintaining the rigid straightness of the spine. X-ray examination should be carried out as early as possible to see whether disease is present or not whenever there is constant pain in the back.

Treatment is the same as for any other tuberculous condition: that is, rest, fresh air and good food. Early treatment may be successful in preventing deformity, and good results are often obtained by sunlight treatment and the application of suitable plaster casts. (*See also* BACKBONE; TUBERCULOSIS.)

SPIRITS.—Substances such as whisky, brandy, rum and gin are classed as spirits and they usually contain about 50 per cent. of alcohol. Spirits of various drugs are used in medicine and among the most common are spirit of chloroform, sweet spirit of nitre, aromatic spirit of ammonia (which is better known as sal volatile), spirit of ether, spirit of camphor, and spirits of various volatile oils such as peppermint, juniper, lavender and rosemary. Plain spirit (alcohol) or eau-de-Cologne are often used on the skin for their soothing effect and they are also used to harden the skin to prevent bed-sores and foot soreness. (*See also* ALCOHOL.)

SPIROCHÆTE.—The term spirochæte is applied to a group of tiny germs or organisms which have a spiral structure like a corkscrew. They are capable of wriggling their way through the blood or tissues, and it has been proved that they are the cause of several important diseases in human beings, especially syphilis and Vincent's angina. (*See also* GERMS.)

SPITTING.—*See* EXPECTORATION.

SPITTING OF BLOOD.—(*See* BLOOD SPITTING, *also* HÆMOPTYSIS.)

SPLEEN.—The spleen is an organ of the body, about 5 in. long, situated behind the stomach in the upper left corner of the abdomen, which is connected with the rest of the body only by its nerves, lymphatics, and comparatively large blood-vessels. Its function was for long a mystery and is not yet fully understood. It is sometimes classed among the ductless glands, as it undoubtedly has an internal secretion which it pours into the blood-stream; but this secretion is apparently of but slight importance, as the spleen can be completely removed surgically without affecting the health of the body; extract of the spleen has been recommended for various diseases, even tuberculosis and asthma, but authoritative medical opinion thinks little of its value. When the spleen is cut open it is seen to be composed of a soft red pulp with white patches, and with a tough muscular network coming from the capsule which supports the pulpy substance. The chief function of the spleen is connected with the formation of the corpuscles of the blood, both red and white blood corpuscles apparently being formed in the spleen; according to some authorities the spleen has also the function of breaking-down old worn-out red. blood corpuscles, but this is more doubtful. When the spleen is removed surgically the lymphatic glands and the red bone-marrow in the body show signs of change, probably because these blood corpuscle-producing parts of the body have to take on the work of the spleen as well.

SPLEEN, DISEASES OF.—*Enlargement of the Spleen* is an important sign in a number of diseases, especially malaria and typhoid fever; other diseases in which it may be enlarged are streptococcal septicæmia, syphilis, tuberculosis, rickets, pernicious anæmia, leukæmia, splenic anæmia, and the tropical disease kala azar. The enormously enlarged spleen in malaria is popularly known as "ague-cake"; sometimes the spleen may be so enlarged—especially in the tropical diseases—that it fills the whole of the left side of the abdomen, and is recognized by feeling the notch on its front border.

Rupture of the Spleen is a not uncommon result of an accident, especially when a vehicle has passed over the abdomen. The injured person has severe abdominal pain and shows signs (pallor, faintness) of internal hæmorrhage. A surgical operation is necessary to save life.

Splenic anæmia (Banti's disease) is a primary disease but the cause is unknown; it is probably due to an infection. It occurs chiefly in young men, and is characterised by anæmia, bleeding from the nose, stomach or bowel, and enlargement of the spleen; it usually requires an expert physician to recognize the disease. If untreated, it is always fatal, but surgical removal of the spleen, if done early in the course of the disease, gives good results.

Gaucher's disease (splenomegaly) is a rare disease of childhood, characterized by enlargement of the spleen and the presence of a particular type of cell in it. The affected person usually lives for many years, but usually succumbs from the disease in the end.

Von Jaksch's anæmia is a disease of infancy, characterized by anæmia and enlargement of the spleen, liver and lymph glands. It is usually associated with rickets, but the cause is unknown. Arsenic is said to be good for this disease, but the majority of cases prove fatal, from complications such as broncho-pneumonia or gastro-enteritis.

SPLINTS.—Splints are most commonly made of wood and padded with wool or some such soft material. They are used for keeping the ends of a fractured bone at rest and for maintaining the shape of a limb. In rendering first-aid, splints extending beyond the joints above and below the fracture must be applied before the patient is moved. In an emergency splints may be made out of walking-sticks, broom-handles, branches, thick newspaper, and in fact anything of suitable length and stiffness. (*See also* FIRST-AID SUPPLEMENT; FRACTURES.)

SPONDYLITIS DEFORMANS.—This is another term for caries of the spine. (*See also* SPINAL CURVATURE.)

SPONGE.—What is known as a sponge is really a group of animals which develop on the bottom of shallow seas. After they have been prepared for commercial purposes they are fine in texture and are extensively used for toilet uses because of their absorbent nature. At one time they were used a great deal by surgeons for mopping up blood, etc., but owing to the difficulty of keeping them sterilized they are now replaced by swabs made of sterilized gauze.

SPORADIC.—A disease is said to be sporadic if cases develop here and there. The term is used as opposed to epidemic outbreaks. (*See also* EPIDEMIC.)

SPOTTED FEVER.—This is a popular term for *cerebro-spinal fever.* (*See also* CEREBRO-SPINAL FEVER.)

SPRAINS AND STRAINS.—A sprain is a wrenching of a joint producing a stretching or tearing of the ligaments. A strain is the wrenching of muscles or tendons. In a sprain, one or more of the ligaments of a joint are torn so that there is bleeding and weakness of the joint. The blood is usually seen under the skin in the form of a bruise. The membrane which forms the lining of the joint becomes inflamed and pours out a certain amount of fluid so that the joint swells and becomes stiff and painful to move. If possible, a firm bandage should be applied immediately so as to prevent the swelling becoming too large and also to prevent bleeding. It is the absorption of blood from the tissues which makes the cure of a sprain such a lengthy business. The parts surrounding the sprain should be gently massaged so as to keep the blood circulating at its best, and a suitable support such as adhesive strapping may be used to rest the part. The patient should be encouraged to exercise the joint gently as soon as he is able, otherwise adhesions may form. An X-ray examination is desirable in order to make sure that no damage has been done to any of the surrounding nerves. (*See also* FIRST-AID SUPPLEMENT.)

SPRAY.—Many drugs are applied to the body, especially the throat, in the form of a fine spray. The apparatus for applying the spray is known as an atomizer, nebulizer or vaporizer. (*See also* ATOMIZER; INHALATION.)

SPRING CATARRH (conjunctivitis vernalis).—This disease is really incorrectly named, since there is no true inflammation of the *conjunctiva* and linings of the eyelids. It is also called spring or vernal catarrh. The disease is remarkable in that it only occurs, as its name implies, when the spring comes. It lasts the whole summer, becoming worse or better as the thermometer rises or falls, and temporarily disappears with the cold weather.

Symptoms.—In the spring the eye become very red and itchy. When the eyes are examined the membrane lining the eye-lids is seen to be covered with elevations, looking rather like those of the disease called *trachoma*, but described as being rather of a "cobble-stone" than a "sago-grain" shape. Though they become very hard, these masses give rise to no permanent trouble, and during the winter, as has been said, the eyes are quite comfortable. The conjunctiva surrounding the cornea is thickened and sightly pigmented, and the lids have a "milky" appearance. The disease is not very frequent; but when it occurs it may return every spring for perhaps ten years, and then disappear. The cause has not definitely been proved, but as the blood in this disease and in hay-fever undergoes a similar change, it is thought that there may be some relationship between the two diseases.

Treatment.—No method is more than palliative, though radium and X-rays are now said to give promising results. Some authorities advise surgical removal of the "cobble-stone" elevations; others advise the use of adrenaline. Astringent lotions may be used, but they merely give temporary relief. Smoked glasses may be worn; and the patient is advised to keep as cool as possible, and to avoid any exposure to bright sun and wind.

SPRUE.—Sprue, or psilosis, is a tropical disease also known as hill diarrhœa, Ceylon sore mouth, etc. It is met with chiefly in the tropics, particularly in Ceylon, Southern India, China, the Straits Settlements and the West Indies.

Symptoms.—The disease usually commences with slight attacks of sore mouth, indigestion, and morning diarrhœa. These symptoms gradually become worse and are more and more constant. The mouth is very tender and raw and the taking of food becomes a very painful process indeed. The diarrhœa, which is always worse in the morning and sometimes absent for the rest of the day, may be very excessive, the stools being copious, pale, frothy and very offensive. The patient may also complain of dyspeptic symptoms and distention of the stomach from flatulence. This may go on for months, and the patient's strength becomes gradually undermined and he tends to become thin and anæmic, depressed and mentally irritable. The cause of the condition is at present unknown, but it is believed to be caused by lack of the proper vitamins in the diet. In well-developed cases, the stools are found to contain a yeast fungus which is generally believed to be responsible for the continued catarrh in the bowels.

Treatment.—The main treatment consists in dieting the patient, and great success seems to be derived from taking a milk diet. Fruit diets are also recommended, and in some cases meat and meat juices seem to suit the patient better. Change of residence, if possible, to a more temperate climate should be considered as soon as the patient is strong enough to be moved.

SPUTUM.—This term is applied to the material spat out of the mouth. It may consist of saliva from the mouth or of secretions from the lungs, the back of the throat or nose. Examination of the sputum is useful in many cases as it may reveal the presence of certain diseases in the lungs. In those who suffer from chronic bronchitis, it will be found that, on rising in the morning, a certain amount of sputum is always present. This is usually quite inoffensive in nature, but should it acquire an offensive odour, it is characteristic of abscess or gangrene of the lungs. Sputum is normally of a greyish shade, but in those who smoke a great deal or who work in coal mines, etc., the expectoration may be black in colour. In lobar pneumonia the sputum is often tinged with blood, and for this reason it is termed rusty sputum. In consumption the sputum ranges from pink to bright red, according to the amount of blood mixed with it. In some cases of cancer of the lungs the sputum is said to resemble prune juice owing to the presence of blood. Microscopic examination of the sputum in cases of asthma may reveal the presence of peculiar structures known as Curschmann's spirals. (*See also* EXPECTORATION; TUBERCULOSIS.)

SQUAMOUS.—Derived from a Latin word meaning scale, the term squamous is used to describe several structures in the body to indicate that they are thin or flattened, or scale-like. (*See also* DESQUAMATION.)

SQUILL.—This popular drug is obtained from the large round bulbs of a plant which grows along the shores of the Mediterranean. It has a very bitter taste, and owes its medicinal properties to a substance known as scillitoxin. This drug is classed as an expectorant, which means that it is capable of increasing the flow of saliva. It is too powerful however to be given in cases of acute bronchitis because of the irritation it sets up in the stomach, but it is valuable in chronic bronchitis if the secretion is scanty. Squill should not be given in cases of acute nephritis, for it is too irritating to the kidneys. This drug is often given along with digitailis in the treatment of heart disease.

SQUINT (Strabismus).—Squint or strabismus is caused by a number of conditions: (1) By an error in development; (2) By injury to one of the muscles which move the eye; (3) By injury, disease, or over-stimulation of one of the nerves supplying these muscles, which causes paralysis and lengthening, or over-contraction and shortening, of the muscles; (4) By the presence of some defect in the eye, such as long- or short-sight. This is called *concomitant*, since it is (almost) equal whether the eyes be looking to right or left. *Divergent* squint occurs when one or both eyes turns outwards; *convergent* when one or both turns inwards. The former is sometimes found when there is constant excessive strain in short-sight, the latter in long-sight. The *treatment* of "muscular" squint is, first, that of the injury or disease which has caused the trouble. Prismatic lenses may have to be used to correct

the double vision that sometimes occurs. If all treatment fails, and only then, operative measures are attempted. The treatment of concomitant squint, in both long- and short-sight, is to wear suitable spectacles, which in most cases relieves the condition. Exercises, prescribed by an ophthalmic specialist, are proving successful treatment nowadays. Two objections to spectacles are sometimes made by parents: (1) "The child will grow out of squinting." He may, rarely, but in the meantime weakening of the sight will occur. (2) "The child is too young to wear glasses." This is entirely mistaken; even a tiny child will be quite happy, and so far from refusing to wear glasses, will ask to have them put on each day.

STAMMERING.—A disturbance of speech in which, owing to faulty nervous control of the muscles used in speaking there is a sudden check to the utterance of words, or the sounds with which the difficulty arises are repeated over and over again. It is the difficulty of performing the necessary movements of the tongue and lips with, at the same time producing the sounds in the voice-box or larynx that causes a person to stammer. As a rule, the difficulty only arises with certain letters of the alphabet, most commonly with the consonants p, b, t, d, g, k, and is experienced generally only when these letters occur at the beginnings of words, no difficulty being shown when the same letters occur in the middle of words. It is characteristic of stammerers that they always persist in trying to pronounce the difficult letter or letters. They will never substitute a more easily pronounced word, even if this be suggested to them. A curious thing about stammering is that it is only present when the victim speaks in a conversational tone; if he sings, no stammer can be detected. The usual explanation for this is that the thoughts are then occupied with getting the correct musical tones and the muscles which control the movements of speaking are then used unconsciously. Jerkiness in speech usually accompanies a stammer, and indeed may be present in adults long after the original stammer has disappeared. Stammering appears most often in childhood or during the school period of life, when it may prove a very real handicap to a child's progress.

Treatment.—The treatment of stammering consists mainly in re-educating the child in the use of his voice sounds, and encouraging him to persevere in breathing exercises designed to improve the production of the voice.

STAPHYLOCOCCUS.—This is the name given to a particular type of germ which is responsible for various pus-forming diseases in man.. (*See also* GERM.)

STAPHYLOMA.—This condition consists of a bulging forward of the cornea of the eye which leads to weakness, or complete loss of vision. (*See also* EYE; CORNEA.)

STARCH.—Starch is a very important item in the group of foods known as carbohydrates and it is found to a great extent in vegetables and cereals. (*See also* SPECIAL SUPPLEMENT on DIET AND INVALID COOKERY.) Starch is used as an ingredient in many dusting powders for application to chafed and inflamed areas of skin. A starch enema is often used to sooth an inflamed bowel and to check diarrhœa. For this purpose a little laudanum may be added to the starch. (*See also* ENEMA.)

STASIS.—The stoppage in the flow of blood through the veins is known as venous stasis and this condition is seen especially in cases of heart failure. Delay in the passage of food through the intestines is known as intestinal stasis. The lymphatic channels may become obstructed by the presence of worms, as seen in the condition known as elephantiasis which results in lymphatic stasis and swelling of the limbs. (*See also* CONSTIPATION; DIGESTION.)

STATUS LYMPHATICUS.—A condition in which all the lymphatic tissues, the thymus, the spleen, and the bone marrow, etc., are markedly overgrown, is known as status lymphaticus or lymphatism. It occurs most commonly in young children, usually of the plump and flabby type. The condition may never be suspected by the parents as the child always appears to be in good health, but death may occur quite suddenly from a slight shock, and a large percentage of patients who die while under an anæsthetic suffer from status lymphaticus. (*See also* LYMPHATIC SYSTEM.)

STAVESACRE.—The seeds of this plant are crushed and made into an ointment which is very effective in killing lice and other animal parasites. (*See also* PARASITES.)

STENOSIS.—The term is used to describe the narrowing of any of the natural openings of the body. This may be caused by disease,

such as inflammation or the growth of a tumour, etc., or it may be due to pressure from outside. The word is specially used in connection with the openings of the heart and the opening of the gullet.

STENSON'S DUCT.—The parotid glands, the largest pair of salivary glands, have tubes which convey the saliva to the mouth and are known as Stenson's ducts. (*See also* SALIVARY GLANDS.)

STERILITY.—Barrenness or sterility means the inability to produce offspring. The causes of sterility in the female may be due to some malformation (sometimes quite slight) of the generative organs, to a lack of healthy activity in the ovaries such as is often met with in cases of obesity, to thyroid deficiency, to displacement of the womb, or to inflammatory conditions due to disease in the genital organs. In the male there may be non-development of the testicles, but chronic inflammation of the male genital organs, usually the result of gonorrhœa, is the most frequent cause. Many cases of sterility can be cured by treatment, operative and otherwise; and it has been known that the divorced partners of a childless marriage have each proved to be capable of producing children in a subsequent marriage. When a marriage appears to be fruitless, it is advisable that both the wife and the husband should be examined by a specialist, and if living spermatozoa from the male can be seen by immediate examination under the microscope the wife is obviously the infertile partner. But it would be useless to treat her, surgically or otherwise, if it is the husband who is infertile.

STERILIZATION.—The process by which substances, including foods, etc., are freed from germs is known as sterilization. (*See also* ASEPSIS; PASTURIZATION.)

STERNUM.—This is another name for the breast-bone. (*See also* BREAST.)

STETHOSCOPE.—An instrument used for listening to the sounds produced anywhere within the body. (*See also* AUSCULTATION.)

STICKING-PLASTER. — *See* ADHESIVE PLASTER.

STIFF NECK.—The commonest cause of stiff neck is muscular rheumatism or fibrositis usually the result of more or less proonged exposure to cold, damp, or a draught. *See also* FIBROSITIS; RHEUMATISM.)

STILL-BIRTH.—A child which measures over thirteen inches in length and which shows no sign of life after it has been born, is termed a still-born child. According to English law, every infant born alive must be notified to the medical officer of health within thirty-six hours of birth, and with regard to still-births, the registrar of births and deaths must be notified as well. (*See also* ABORTION; CHILD-BIRTH; LABOUR.)

STILL'S DISEASE.—This is a rare form of arthritis, called after the London children's specialist who described it, which occurs in young children. There is a great deal of inflammation in the joints, and swelling and enlargement of the lymphatic glands and spleen. The child never feels well and there may be irregular bouts of fever. The cause of the disease is believed to be due to infection with a germ absorbed from the throat, possibly the tonsils.

Treatment.—The treatment consists of giving special baths, plenty of fresh air and sunlight, and keeping up the vitality with good food. Any source of infection, such as bad teeth or septic tonsils, must be removed. Artificial sunlight has proved to be of great value and regular massage should be carried out in order to prevent deformities of the inflamed joints. (*See also* ARTHRITIS.)

STIMULANT.—Any drug or other agent which is capable of increasing the activity of the body is described as a stimulant. A stimulant may be given to produce an immediate effect on any part of the body, whereas a tonic is given when a more lasting effect is required. Alcohol in small doses acts as a stimulant, but in larger quantities it depresses the brain centres. Ammonia administered as smelling-salts. Strong coffee or tea also act as stimulants. The application of heat will stimulate the action of the skin and cause increased sweating to take place. Stimulants are grouped according to the part of the body on which they have effect. For example, there are heart, lung, digestive, kidney, brain, spinal cord, skin and other stimulants, but the stimulation of one organ may have a stimulating effect on others. (*See also* ALCOHOL; AMMONIA; CAFFEINE.)

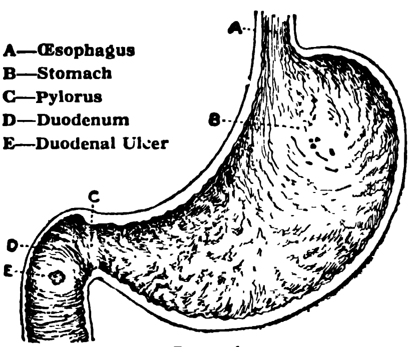
STING.—*See* BITES AND STINGS.

STITCH.—A sudden spasm of pain in the side usually due to cramp in the muscles is popularly referred to as stitch. The pain may go as suddenly as it comes, and rubbing

may give some relief if the part still feels tender. (*See also* CRAMP.)

STOKES-ADAMS DISEASE.—This is the name (after the two Irish physicians who first described it) given to a condition in which the heart stops beating for a short period owing to blockage. The condition is a serious one, and requires the advice of an expert physician. (*See also* HEART.)

STOMACH.—The stomach is a large, more or less pear-shaped dilatation of the digestive canal, about one foot in length and four or five inches in breadth, holding normally about two or three pints of fluid; it communicates at its upper end with the gullet (œsophagus) and at its lower end with the first part of the small intestine (duo-



Stomach

denum) through a valve-like opening called the pylorus. It is situated in the upper part of the left side of the abdomen, and when dilated may press through the diaphragm upon the heart (which lies above it) so much as to give rise to palpitations and other symptoms that a nervous person may attribute to an affection of the heart. The shape of the stomach naturally varies with the amount of food it contains and with the stage to which digestion has progressed.

The walls of the stomach contract in rhythmic waves, which take about half a minute each to pass along the whole length of the stomach. The food is received by the stomach, masticated and mixed with saliva and mucus, and the business of the stomach is to continue the process of digestion that has been begun. The stomach wall has four layers, an outer layer of peritoneum, next a muscular layer, then a sub-mucous layer, and last an internal layer of mucous membrane, in the folds of which are innumerable microscopic glands, some of which secrete mucus and some the gastric (digestive) juice. This juice contains two ferments, (1) pepsin, which softens and dissolves the fibrous part of meat; and (2) rennin, which digests and coagulates milk. It also contains hydrochloric acid, which keeps the digestive action of the pepsin and also helps to prevent putrefaction of the food in the stomach.

This is not absorbed in the stomach—alcohol is an exception in being absorbed straight from the stomach, even water is sent on to the intestine—but is mixed thoroughly there and converted into a milky semi-fluid substance called "chyme," and then squirted gradually through the small pyloric opening into the duodenum, where more important processes of digestion take place; absorption into the body takes place in the small intestine.

STOMACH, DISEASES OF.—With the exception of cancer of the stomach—which follows herewith—the diseases of the stomach are dealt with under separate headings. (*See also* DYSPEPSIA; GASTRIC ULCER; GASTRITIS.)

Cancer of the stomach most usually occurs in men over the age of 40, and, contrary to what used to be said, does *not* commonly result from a gastric ulcer. The symptoms are often like those of ulcer of the stomach, and it will need an expert specialist to make an accurate diagnosis, with the aid of test-meals and X-ray examinations; as the symptoms are sometimes like those of pernicious anæmia (q.v.), a blood examination may also be necessary. A middle-aged person (especially about the middle fifties) who *suddenly* develops symptoms of chronic dyspepsia, having never had them before, should have these expert examinations carried out in order to exclude the possibility of cancer of the stomach. The *treatment* is obviously an operation for removal of the cancer, and the ultimate outlook is bad unless the operation is carried out early in the course of the disease.

STOMACH TUBE.—A soft rubber tube, usually about thirty inches in length, is used for drawing off the contents of the stomach or for washing out the stomach when it contains some poisonous material. (*See also* FORCIBLE FEEDING; IRRIGATION.)

STOMATITIS.—Inflammation of the mouth is called stomatitis. It is treated by

alkaline mouth-washes, such as warm bicarbonate of soda solution or glycothymoline, and attention to the teeth or other cause.

STONE.—*See* CALCULUS; GALL-STONES.

STOOLS.—Fæces is the term applied to discharges from the bowel, but the terms stools or motions are more commonly used. These discharges naturally vary in colour and amount in accordance with the state of the health and the quality of the diet, but normal fæces are brown in colour and the quantity discharged in one day by an adult should be approximately six ounces. This brown colour is due to substances in the bile, the chief of which is a pigment called *stercobilin.* Certain articles of food may change the colour of the fæces; for example, if the diet consists largely of meat, the discharges from the bowel will be darker in colour, while milk and starchy foods tend to make them a light yellow colour. Too much fat in the diet may produce stools of an almost milky whiteness, or this may be the result of some disease of the pancreas in which fat is not being properly digested. Pale, clay-coloured stools usually indicate that the normal amount of bile is not entering into the intestines. This usually occurs in jaundice and the odour of the stools may be particularly offensive. The motions of children suffering from diarrhœa are, most commonly, bright green in colour. This is thought to be due to bacterial decomposition.

Bright red blood mixed with the fæces may come from a hæmorrhage round about the anus or rectum, such as from piles or some other affection of that region. When the stools are tarry-looking this is termed melæna, and this condition is caused by the presence of blood which has altered in appearance in its passage through the intestines. This condition indicates that there is a hæmorrhage high up in the bowel or in the stomach, usually from a gastric or duodenal ulcer. The colour of the stools may vary as a result of taking certain drugs. For example, drugs such as iron or bismuth may cause them to turn black; while rhubarb and senna may give them a bright colour. Incontinence of the bowel, or inability to hold the stools, is a symptoms of certain diseases of the nervous system, or it may be due to laxness of the muscles surrounding the anus. Pain at stool is a very characteristic symptom of a fissure or it may be due to inflamed piles. (*See also* CONSTIPATION; DIARRHŒA.)

STORAX.—Also known as styrax, this is a balsam obtained from the inner bark of a tree known as oriental sweet-gum. It is used in bronchial affections and for the treatment of catarrh of the urinary passages. (*See also* BALSAM.)

STOUTNESS.—*See* article on OBESITY.

STRABISMUS.—This is another name for what is popularly known as squint. (*See also* SQUINT.)

STRAIN.—Any part of the body may suffer harm by being taxed above its normal powers; and a continued strain, whether mental or physical, will eventually lead to harmful results and much depression. The main treatment for strain of any sort is rest, and, if the strain is muscular, massage should be given to the part in order to restore tone to the tissues. Cases of mental strain, caused by overwork or too much worry, should be treated by a complete change of surroundings, and tonics and fresh air will help to assist the cure. (*See also* ATHLETICS.)

STRAIT-JACKET.—A jacket used as a form of restraint when necessary for mentally diseased patients is referred to as a strait-jacket. (*See also* JACKET.)

STRAMONIUM.—This drug, which is used chiefly for asthma, is obtained from the leaves of the thorn-apple. Attacks of asthma are often relieved by smoking cigarettes made from stramonium leaves, or by inhaling the fumes given off from the burning powdered leaves. (*See also* ASTHMA; ATROPINE.)

STRANGULATION.—The most popular use of this word is in connection with throttling or strangling which is caused by pressure on the windpipe, but the term is also used to describe a stoppage of the flow of blood due to pressure or constriction. The commonest condition in which this occurs is a strangulated hernia, an extremely dangerous condition. (*See also* HERNIA; RUPTURE.)

STRANGURY.—This term is used to describe the condition in which there is a desire to pass urine, but the discharge is very slow and painful and only a few drops may come away. The causes of such a condition are numerous. It may be due to inflammation in the kidneys, bladder, or urinary passages, or there may be a stone present. Gonorrhœa and enlargement of the prostatic

gland may give rise to strangury in the male, and in women it may be due to prolapse of the womb or some other condition of the womb or ovaries. It may occur also in certain diseases of the nervous system or it may be due to the effects of various drugs.

Treatment of the condition naturally depends upon the cause, but hot baths and large quantities of bland fluids will help to relieve the immediate pain. (*See also* URINE.)

STRAWBERRY MARK.—This is one form of birthmark which shows on the skin as a red or bluish-red stain. (*See also* BIRTHMARK.)

STREPTOCOCCUS.—A special variety of germs which, when seen under the microscope, have the appearance of a string of beads. They are responsible for a very wide range of diseases, including tonsillitis, scarlet fever, and erysipelas. (*See also* GERMS.)

STREPTOTHRIX.—This name is given to a group of germs that are closely allied to fungus or mould and which occasionally produce diseases in man. (*See also* FUNGUS.)

STRICTURE.—The narrowing of any of the natural passages of the body, such as the urethra, the bowel or the gullet, is known as stricture. Most cases are caused by inflammation or as a result of scarring of the tissues, but it may be due to the growth of a tumour or to pressure caused by such a growth in a neighbouring organ. In some situations a stricture is referred to as stenosis. (*See also* STENOSIS.)

STRIDOR.—A peculiar harsh sound produced whilst breathing is known as stridor. It sometimes resembles a whistling noise, and it is due to obstruction in the larynx. (*See also* CROUP; CROWING; DIPHTHERIA; LARYNX.)

STROKE.—A stroke is a sudden and severe attack of apoplexy or of paralysis, or it may be used to describe sunstroke. (*See also* APOPLEXY; PARALYSIS; SUNSTROKE.)

STROMA.—The tissues which support and cover an internal organ are described as stroma. (*See also* CONNECTIVE TISSUE.)

STROPHANTHUS.—The drug known as strophanthus is obtained from the seeds of an African plant from which the natives made the kombé arrow poison. In its action this drug is very similar to digitalis and it is used to strengthen the force of the heart-beat and to correct irregularities. (*See also* DIGITALIS.)

STROPHULUS.—This name was once applied to various skin disorders, including tooth-rash and gum-rash, but the term is now restricted to the disease known as the urticaria of children or lichen urticatus. (*See also* URTICARIA.)

STRYCHNINE.—Strychnine is an alkaloid drug which is prepared from the seeds of an Eastern plant known as nux vomica. Tincture of nux vomica is often given as a tonic in convalescence or in indigestion.

Strychnine is capable of increasing the tone of the muscles, and because of its stimulating effect it is included in many nerve tonics; as a hypodermic injection it is a powerful heart stimulant.

Poisoning by strychnine.—Large doses are very poisonous indeed and may have fatal consequences. It causes the muscles all over the body to contract violently with the result that the patient is unable to breathe. The convulsion lasts a minute or two, then the muscles relax, and the patient feels exhausted and sweats all over. The convulsions soon come on again and increase in severity. The slightest noise or even a bright light will bring on the convulsions, and unless treatment is given the patient may die from exhaustion and asphyxia. The symptoms of strychnine poisoning are similar to tetanus.

Treatment.—The patient should at once be put under chloroform or ether. The stomach should be washed out with a solution of permanganate of potash and large doses of chloral hydrate or bromide should be injected into the rectum. Apply artificial respiration if necessary. Rectal injections of a new drug, known as avertin, are also recommended. (*See also* POISONS IN FIRST AID SUPPLEMENT.)

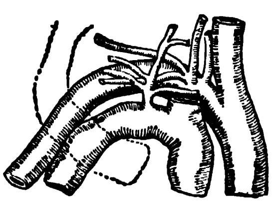
STUPOR.—A mental and physical state in which the patient is unresponsive and indifferent to his surroundings. The condition varies from the mildest case in which the patient is little more depressed and indifferent to the world about him than are normal people suffering from a "fit of the blues" up to a state in which the patient appears to be unconscious, lying in any position in which he is placed and not attempting to feed himself or attend to the calls of Nature. If left alone, these patients with severe stupor die of starvation, but if properly treated, and fed by a tube, they keep up their weight and may even improve in bodily condition during their illness. Recovery commences slowly but gradually,

even though the stupor may persist for three to four months.

Stupor occurs in several different forms of mental disorder, but chiefly in manic-depressive insanity, during the depressed stage, and in melancholia. Stupor is also seen in certain diseases as an early stage in coma. (*See also* COMA; DIABETES.)

STUTTER.—*See* STAMMERING.

STYE (Hordeolum).—This consists in the formation of a boil in the "socket" of an eyelash. It may occur on either the upper or the lower lid; and styes often appear in crops, now on one lid, now on the other. Both eyes may be affected. The disease may occur at any time of life, but is especially common about puberty in either sex. In adults, it is often very painful, and the conjunctiva covering the eyeball may swell, causing much distress and alarm to the patient. A single stye may be caused by local infection; repeated styes, however, always indicate a poor condition of general health, or point to the need of glasses. Local treatment consists in removal of the eyelash, either by forceps or an incision, squeezing out the pus, and applying a warm boric acid fomentation (this is cleaner and easier to apply than a poultice). To prevent recurrence, the eyes should be bathed with warm boric lotion several times daily, and the lids then massaged with "golden ointment." If styes persist in spite of local treatment, tonics, or glasses, chloride or sulphide of calcium internally helps to check their occurrence. Remedies, such as cold tea, have little virtue beyond that of the bathing.



Subclavian Artery and Vein (first rib in dotted outline)

STYPTICS.—Styptics are substances which check bleeding either by making the blood-vessels contract or by causing the blood to clot. Cold water or ice is often valuable for this purpose, or sometimes very hot water applied directly on the bleeding surface will cause it to stop. Drugs which are capable of arresting bleeding include adrenaline, ergot, hydrogen peroxide, perchloride of iron, sulphate of copper, nitrate of silver, tannic acid, and alum. (*See also* HÆMORRHAGE.)

STYRAX.—*See* STORAX.

SUBCLAVIAN.—The subclavian artery and vein are important blood-vessels which pass to the upper arm between the collar-bone and the first rib. (*See also* ARTERIES.)

SUBCONSCIOUS is that state in which mental processes take place and objects and events are seen or experienced without the mind being completely and definitely conscious of them. Although such subconscious events may be forgotten, yet they may have an influence over the mind or something may later arouse the mind to take notice of them. Nowadays a good deal of importance is being attached to such subsconscious experiences, which are considered to be responsible for neurasthenic or neurotic conditions; these can then be cured only by remembering fully the subconscious event or experience and getting the mind to look at it in its proper perspective, usually by analysis.

SUBCUTANEOUS.—An adjective meaning "beneath the skin." Thus hypodermic injections, or injections beneath the skin, are also described as subcutaneous injections. (*See also* INJECTION.)

SUBLIMATION.—In chemistry this term is applied to the processes of converting a solid substance into a vapour and recondensing it. The term is also used in a mental sense for the process of converting instinctive sexual desires to higher forms of activity. (*See also* SEX HYGIENE.)

SUBLINGUAL GLAND.—The smallest of the salivary glands, the sublingual glands can be seen lying beneath the tongue. The ducts of the sublingual glands are eight or ten in number, but they are too small to be seen ordinarily. (*See also* SALIVARY GLAND.)

SUBMAXILLARY GLAND.—A pair of salivary glands, lying one on each side of the tongue and between it and the lower jaw, are known as the submaxillary glands. (*See also* SALIVARY GLAND.)

SUBSULTUS.—The twitching of the muscles, especially of the hands and feet, that occurs after some fevers.

SUCCUS.—The Latin word for juice, succus is sometimes applied to the intestinal juices of the body. In pharmacology, however, succus is a preparation consisting of the juice of a fresh plant. (*See also* DIGESTION.)

SUCKLING.—This term means the natural feeding of an infant at its mother's breast. (*See also* SUPPLEMENT ON INFANT FEEDING.)

SUDAMINA.—An eruption of tiny white blisters caused by obstruction of the sweat glands is sometimes called sudamina, or sudamen. (*See also* MILIARIA.)

SUDORIFIC.—Any drug or agent which is capable of greatly increasing the secretion of sweat is called a sudorific. A diaphoretic is also a sweat stimulant but it is not so powerful in its action. (*See also* DIAPHORETIC.)

SUFFOCATION.—The sensation of choking is also described as suffocation or asphyxia. (*See also* ASPHYXIA.)

SUFFUSION.—The flow of a body-fluid into the surrounding tissues is known as a suffusion. For example, after a sprain, the surrounding parts may be suffused with blood which has escaped from the torn blood-vessels. The term is also applied to pouring water over a patient as a method of treatment.

SUGAR.—Sugar belongs to the carbohydrate class of food and it contains many important chemical bodies such as carbon, hydrogen, and oxygen. Grape sugar, or dextrose, is found in various kinds of fruit, and it is this sugar which is passed in the urine by patients suffering from diabetes mellitus. Cane sugar, or sucrose, is a valuable food and it supplies the body with heat and energy. It is also capable of producing fat on the body, so an excess should be avoided by those who put on weight easily. (*See also* DIABETES; SPECIAL SUPPLEMENT on DIET AND INVALID COOKERY.)

SUGGESTION.—This term is applied to a mental process used in psychotherapy. The patient is led to accept facts without exercising his own will or judgment. (*See also* AUTO-SUGGESTION; PSYCHOTHERAPY.)

SULCUS.—A furrow or groove, applied especially to the fissures of the brain. (*See also* BRAIN.)

SULPHATE.—A salt of sulphuric acid is called a sulphate. The sulphates of the heavy metals include iron, zinc, and copper, while the sulphates of the alkalies include magnesium sulphate (Epsom salts), potassium sulphate, and the sulphates of sodium.

SULPHONAL.—Sulphonal is an artificially prepared drug which acts as a hypnotic. It is rather slow in action and so has rather fallen out of use, other more quickly acting drugs being preferred.

SULPHUR.—Sulphur, a yellow non-metallic element, is used in medicine in two forms, the sublimated sulphur, or flowers of sulphur, and precipitated sulphur, also known as milk of sulphur. Sulphur ointment rubbed into the skin is one of the best treatments for the itch, or scabies. The skin should be well scrubbed with soap and hot water before the ointment is rubbed in. The patient should do this before going to bed at night, and wash the ointment off the next morning. If this is done for three or four evenings the condition will probably be cured. Mild sulphur preparations, especially a lotion made of the milk of sulphur, may be used for acne on the face. Sulphur is also used in baths in cases of skin diseases and for this purpose sulphurated potassium is generally used. Dandruff and seborrhœa are also treated with sulphur, but as the drug is irritating to the skin great care must be taken not to prolong the treatment. Sulphur is a very good laxative, especially for children, and it is very commonly mixed with liquorice powder. Lozenges containing sulphur are often taken at bedtime as a remedy for mild constipation. An old-fashioned treatment consists of sulphur and treacle mixed into a paste. Sulphur is also said to be a useful drug in rheumatism (though this has been denied by some authorities) and it may be taken in the form of natural sulphur waters.

SULPHURIC ACID.—Also known as oil of vitriol, sulphuric acid is a colourless, oily liquid which is very corrosive. Dilute sulphuric acid and aromatic sulphuric acid are used for checking diarrhœa and bleeding from the bowel, and they also stimulate the flow of the saliva, intestinal juice and bile, thereby improving the appetite and digestion. (*See also* CORROSIVE.)

SULPHUROUS ACID.—A colourless liquid, with a strong smell of sulphur, this acid is used in medicine as an antiseptic and disinfectant. When mixed with glycerine it is used as a lotion for various skin diseases such as ringworm, etc. (*See also* SULPHUR.)

SUMMER DIARRHŒA.—This form of diarrhœa is common in young children and may be a serious condition. (*See also* DIARRHŒA.)

SUN-BATHING.—By sun-bathing is meant the exposure of the body, with or without a minimum of dress, to the fresh air and the sun's rays. Sunlight is a stimulant, under certain conditions a powerful one, and

it must be used in moderation, if the effect is to be beneficial. Generally speaking, sturdy young adults, who bronze readily, tolerate the longest exposures. Red-haired, freckled, elderly and infirm persons should exercise more caution, and no one suffering from an organic disease should indulge in sun-baths except on expert medical advice. No hard and fast rule, then, can be laid down, and the bather must use his or her own common sense. He should never feel too hot or too cold, and should always protect the head in strong sunshine. There should be a feeling of buoyancy and exhilaration after the sun-bath. Weariness, lassitude, irritability, sickness, or fever are sure signs of over-exposure. Novices invariably tend to overdo it. They should accustom themselves by progressive exposure first of the legs, then of the trunk, and finally of the whole body. Sun erythema—reddening of the skin—is the first stage of sunburn and appears some hours after the bath. Its degree is a guide to the adequacy of the first exposure. Once the skin is well pigmented progressively longer exposures may be enjoyed until an ultimate daily maximum of two to three hours is reached. Exposure beyond this point brings no benefit and may have definite ill-effects. Some people do not tolerate sun-bathing. Often there is a reason for this, which can be found and remedied. Unless this is done, such persons should not indulge.

It is necessary to distinguish between *sun-bathing* and *air-bathing*. Most people confuse the two, and talk of "sun-bathing" on a warm day, regardless of whether the sun is shining or not. Air-bathing has a value of its own; it is quite possible—and an excellent thing for health, for children as well as adults—to have an air-bathe every day in a well-ventilated bedroom. The duration depends on the time of the year, and the room may be warmed in winter. By this means—the entire body is, so to speak, thoroughly ventilated; if exercises are done, its value is much increased. At the sea-side in suitable weather, one may spend the whole day air-bathing, provided that one is sufficiently shaded from the sun. (*See also* SUNLIGHT, ARTIFICIAL; ULTRA-VIOLET RAYS.)

SUNLIGHT, ARTIFICIAL.—The value of sun-bathing is due not to the heat-rays but to what are called the *ultra-violet* or actinic rays, which are the shortest in the solar spectrum, and those of greatest therapeutic value. These rays are most intense in the clear air of mountains or by the sea, and are practically absent in the smoky atmosphere of a manufacturing town. Luckily, they can be obtained by other means than from natural sunlight. All the "artificial sunlight" lamps are capable of producing the ultra-violet rays which are necessary for health, the mercury-vapour lamp being the "richest," as it is the costliest, and needs the greatest experience in using. It can, indeed, only be used by an expert, whereas some of the carbon arc lamps are simple enough for home use by careful people. These simpler lamps may prove of great benefit to health during the winter months.

During the last few years, however, the difficulty of utilizing the winter sunlight has been obviated by the invention of a glass that permits ultra-violet rays to pass through it. The windows of most up-to-date nurseries, schools, and offices are being fitted with this substance.

Ultra-violet rays—when the exposure has been properly timed—produce a general "tonic" and exhilarating effect on the body. Heat production and appetite are increased, the muscles are "toned up," and respiration deepened. Children under treatment show a definite rise in weight. If, however, the exposure has been unduly prolonged, fatigue and exhaustion result. Medically speaking, the effects are local and direct, or remote and indirect: direct, as destroying bacteria (on the surface of the skin only, as the penetrating power of the rays is small); indirect, as this destructive action is assisted by producing what is called a "favourable inflammatory response"—which may be compared to calling up reinforcements in war.

It is found, also, that the germ-destroying power of the blood is increased when all or part of the skin is exposed to these rays, so that the power of the body to resist infection is made greater. The blood content of calcium, phosphorus and iron, all necessary for health, is also increased. This treatment has its greatest therapeutic value in increasing and maintaining bodily tone and energy in many cases of disease; it has been described as "Nature's cheapest medicine." It is used with marked success in surgical tuberculosis

(i.e. of bones, joints and glands); rickets—sunlight alone will cure rickets, though it will not straighten bones which have become fixed in deformity—nervous asthma and bronchitis; and in convalescent conditions, especially those after infectious diseases.

It often does good in glandular derangements, and is said to stimulate fecundity. Ultra-violet rays have also proved very successful in skin diseases; lupus (a form of tuberculosis occurring on the skin) being especially benefited. In general, one may say that the dry forms of skin disease are more suitable than the moist for this treatment, but each case must be decided individually. Sometimes what appears to be a suitable case responds badly, and *vice versa*. A short-time exposure should be tried as an experiment in all cases. Some forms of baldness also benefit by the use of sun-rays. Combined with heat-rays, it is an excellent treatment for chronic rheumatism. It would be a notable step forward in preventive medicine if artificial sunlight were available for everyone as a tonic during the winter months—especially for children, in whom rickets, debility, and many cases of tuberculosis can be entirely prevented thereby. The body can, so to speak, store sunlight for some time, but the store gradually becomes used up. This can be readily seen in the case of school-children; during the summer term the attendance is the best; as the autumn comes on colds and other infectious diseases gradually increase, and the attendance in the Easter term is often very poor, showing that the summer store of sunlight has run out and natural resistance is at its lowest.

In sun-bathing, certain precautions must be observed. In cases of actual disease, when the artificial sources of ultra-violet rays are generally used, an experimental dose is always given, and if that is satisfactory, the patient is gradually acclimatized to the rays. Some operators prefer to expose the feet first, gradually working up till, in successive treatments, the whole of the body is exposed; others give a very short complete exposure as a first dose, gradually lengthening the time. This type of case must be taken into consideration. The eyes are protected by rubber "goggles," fitted with glass which prevents the passage of the ultra-violet rays which (especially when the lamps are used) are too strong for the eyes, and produce smarting, running of the eyes, and headache. These details are always carefully attended to when sun-bathing is under medical supervision. (*See also* SUN-BATHING.)

"SUNLIGHT CANCER."—This is a disease of the skin caused in susceptible persons by the action of the sun. It does not occur, as a rule, before middle age, in common with all true cancers, and, as its name implies, affects people whose work exposes them to the sun, such as farm-labourers, gamekeepers, sailors, and fishermen. It is sometimes seen in people who leave temperate or cold regions to dwell in the tropics. Little warty growths appear on the exposed areas—the ears, the back of the neck, and the backs of the hands being naturally the most commonly attacked. As a rule, the patients at first think nothing of them, and quite often only seek advice after the growths have lasted for years, and have become definitely cancerous. They are treated in the same way as rodent ulcer. (*See also* RODENT ULCER.)

SUNSTROKE.—Sunstroke, or heatstroke, are the terms applied to the conditions produced by exposure to the strong rays of the sun or to overheated air without sufficient loss of the heat through the skin and its sweat glands. The symptoms may vary in severity from a headache to severe collapse, high fever and delirium. Mild cases may occur in this country, especially at the beginning of a holiday, unless due precautions are taken to cover the head, neck and spine. Special care should be taken with children, otherwise they are liable to become irritable and feverish and may complain of sickness and loss of sleep.

Treatment.—The patient should be kept in a darkened room and given plenty of cool drinks. Sponging the body with cold or tepid water at frequent intervals is very soothing and beneficial. In severe cases strong stimulants for the heart may be necessary, and such cases should not be allowed out under the direct rays of the sun for a long time. (*See also* SUN-BATHING.)

SUPPOSITORY.—Suppositories are usually made of cacao butter or oil of theobroma, and they are a convenient method of introducing drugs into the rectum, urethra, or vagina. Suitable suppositories may be inserted into the rectum in order to relieve pain or itching, or to act as a laxative. To

produce a quick action of the bowels, a piece of ordinary soap may be shaped like a suppository and pushed into the bowel. Suppositories for the vagina are usually cone shaped, and are usually called pessaries; while those for the urethra are long, narrow rods, and are commonly called bougies. Cones or bougies for insertion into the ear are known as aurinaria, and they may be made with a basis of cacao butter or of gelatine and glycerine. Suppositories for the nose are made with gelatine and glycerine and they are known as buginaria.

SUPPRESSION.—When applied to the secretions or excretions of the body, the term suppression means that they cease to flow because they are dried up at the source. For example, suppression of urine may occur in cases of acute inflammation or other disorders of the kidneys, and suppression of the menses occurs during pregnancy. The word suppression is also used in connection with thoughts or actions which are kept under or restrained.

SUPPURATION.—This term is used to indicate the formation of pus or matter. (*See also* ABSCESS; INFLAMMATION; PUS.)

SUPRARENAL GLANDS.—These are two small structures situated above the kidneys which belong to the group of ductless glands. They are also known as the adrenals, and the secretion of the glands is called adrenaline. (*See also* ADRENAL; ADRENALINE; DUCTLESS GLANDS.)

SURGEON.—A member of the medical profession who is qualified to practise surgery; in other words, who may be called upon to perform operations. He is usually, though not necessarily, a Fellow of the Royal College of Surgeons, and prefers to be called "Mr." instead of "Dr." (as, holding a medical qualification, he is entitled to) in order to show this; though in former days it was the physicians who objected to the surgeons (who, unlike the physicians, were not university graduates) being called "Dr."

SUSPENDED ANIMATION.—A death-like state which may occur in cases of asphyxia, catalepsy, hysteria or trance, is described as suspended animation. Tests may have to be carried out to prove that life is still present. (*See also* ASPHYXIA; DEATH.)

SUSPENSORY BANDAGE.—A support for the scrotum or testicle is known as a suspensory belt. It consists of a waist-band from which a bag is suspended. This form of support is necessary in diseases of the scrotum or testicle. (*See also* ABDOMINAL BELT.)

SUTURE.—This term is used in two ways: it may mean the line of joining or closure between two bones, especially the bones of the skull, or it can be applied to the line of stitches used in closing a wound.

SWAB.—A swab is a piece of cotton-wool gauze, lint, or any similar material which is used for surgical purposes.

SWEATING, DISAGREEABLE.—*Bromidrosis* is the term given to a condition in which the sweat becomes evil-smelling, and may be general or local. It occurs in some diseases in their acute stage, and may then, to the trained nose, be an almost certain guide to the diagnosis, each of the diseases having their characteristic odour. They are, chiefly, rheumatic fever, diphtheria, smallpox, cholera, typhoid, syphilis, tuberculosis, uræmia, anæmia and scurvy. In some people not only the breath, but the perspiration becomes odorous after taking such substances as onions, garlic, sulphur, musk, and various others. Bromidrosis under the arms and on the soles of the feet is due to the decomposition of the sweat and of the softened upper layer of the skin by various bacterial organisms, and is equally irksome for the sufferer and for those near him.

Treatment.—For the armpits frequent bathing with very hot water may suffice; together with the use of a dusting powder composed of boric acid, orris root and talc in equal parts (starch powders should *not* be used, as the starch forms a happy breeding-ground for the organisms). The use of dress-shields may aggravate the condition by damming back the sweat, and so helping on both the disagreeable decomposition and the softening of the skin; a form of eczema may follow. For the feet there are many varieties of treatment, but all physicians are agreed that great attention to cleanliness is the chief thing, not only as regards the feet themselves, but also the stockings and shoes. The feet must be washed morning and evening, and, if necessary, during the day, after which an astringent lotion such as Eau-de-Cologne, or boric acid, ½ oz. to 1 pint water, should be used, followed by the powder mentioned above. Salicylic acid, grs. 20–48, to talc 1 oz., may be used as a powder; this helps to absorb the perspiration. A fresh pair

of *boiled* stockings should be worn daily, or, if there is much perspiration, as often as the feet are washed. The shoes should be easy-fitting; if possible, new ones should be bought, and changed as often as the stockings, each pair being well aired when not in use.

Both shoes and stockings should be dusted with the powders. Formerly, various strongly astringent lotions were much used, such as chromic acid, formalin, potassium permanganate and iron perchloride, but their use in many cases brought out a troublesome dermatitis, so they have fallen into disuse. If the perspiration is so excessive that the outer skin becomes softened and peels off, painful cracks may form between the toes and on the soles. In these cases, instead of powder, salicylic acid 2 per cent., in a lanoline base, should be used as a dressing. It is sometimes found that much standing increases the perspiration; also flat foot, which is frequently associated with it. This should be corrected as far as possible. In intractable cases X-rays may be used, but with great caution. It has been found that they may cause an irrita ion of the unhealthy skin, which is far more troublesome than the disease itself. Some physicians recommend sulphur to be taken in large doses. If, however, the trouble is treated *early* and *thoroughly*, local treatment is often sufficient for a complete cure.

SWEETBREAD.—The pancreatic gland (and sometimes the thymus) is used for food, and they are sold under the popular term sweetbread. The sweetbreads of young animals are very nutritious and digestible and, consequently, very suitable for invalids. (*See also* Diet and Invalid Cookery.)

SWEET SPIRIT OF NITRE—also known as nitrous ether. This is a pale yellow liquid with a characteristic smell of ether and a sharp burning taste. It is useful in the treatment of asthma, angina pectoris, and for relieving pain due to stone in the kidney. It is often given at the beginning of a severe cold, influenza or pneumonia. (*See also* Asthma.)

SYCOSIS.—This is a skin disease in which the hair follicles, especially of the chin, are inflamed. The condition is described under the heading Barber's Itch.

SYMPATHETIC NERVOUS SYSTEM is that part of the nervous system which sets energy free when it is most needed, that is, at a time when energy is wanted for bodily defence. In such a state of mind as fear, anger, or intense pain, the sympathetic nervous system comes into play and by its action the heart is enabled to beat more rapidly, the blood-pressure rises, blood is sent in larger quantities than normal to the limbs so that flight is made possible by quicker movements, and certain substances, such as sugar, which are normally stored in various organs of the body, are set free into the blood to enable the individual to act more quickly. The nervous units which make up the sympathetic system are mainly situated in little masses of nervous tissue alongside the backbone, through spaces in which they are connected with the spinal cord. More about the structure of the sympathetic system will be found under the heading of Nervous System.

All the organs are supplied with sympathetic nerves; but the chief nerves of this system go to the pupil of the eye, causing it to enlarge (that is, to dilate); to the sweat glands of the head and neck; to the skin; to the small blood-vessels of the limbs; and to the heart. Symptoms of mild disturbances of the sympathetic nervous system are very common. Such symptoms include flushing of the face, blushing, slight attacks of giddiness, and curious attacks in which the patient thinks he is having a heart attack. The heart palpitates, beats very quickly, and the patient feels a sense of suffocation. It is sometimes difficult to reassure such a patient that there is nothing wrong with his heart, but the fact that there are other symptoms of mild disturbance of the sympathetic nervous system and no signs of real disease of the heart enables the condition to be recognized. The most severe upset of the sympathetic nervous system is seen in that disease of the thyroid gland called *Exophthalmic Goitre*, or Graves' Disease. In this disease all the signs of disturbance of the sympathetic system are present, though the connection between the thyroid gland and the sympathetic system is not yet clear. The eyes protrude, the skin is moist, the hands tremble as though with fear, and the general appearance of the patient is one of a person who has suffered from a bad fright. The heart beats quickly and forcibly and, in the late stages of the disorder, wears itself out in attempting to keep up the pace which is much too rapid for the normal heart to maintain.

Recently a new advance has been made in surgery by operations on the sympathetic system for the relief of a painful and often dangerous condition of the blood-vessels of the legs in elderly people. In this condition, as soon as the patient walks more than a few yards the legs become so painful that walking becomes an impossibility, whilst the legs take on a white colour, due to insufficient blood passing to them. The condition is due to a spasm of the blood-vessels of the legs, so that whilst enough blood may pass through the vessels to supply the legs at rest, as soon as any movements are made the spasm prevents a sufficient supply of blood getting to the muscles and so pain and weakness are caused. It has been found that if the sympathetic nerves which surround the main blood-vessels to the legs are cut, the condition is relieved, if not entirely cured. This operation has been the means of saving many people from a life of complete invalidism.

SYNCOPE.—This is another name for fainting. (*See also* FAINTING.)

SYNDROME.—A group of symptoms of a disease to which some particular name is given is known as a syndrome. For example, the Stokes-Adams syndrome is the occurrence of slow pulse and giddiness which occur in heart-block. There are other syndromes named after people who described them.

SYNOVIAL MEMBRANE.—The membrane which lines the ligaments binding the bones of a joint together is known as the synovial membrane. Synovia or synovial fluid is secreted by this membrane, and in normal conditions it ensures easy movement of one bone on the other. (*See also* JOINT; TENDON.)

SYNOVITIS.—Inflammation of the synovial membrane of a joint is known as synovitis. It is a very painful condition and is usually found in acute rheumatism and other inflammations of the joints. (*See also* RHEUMATISM.)

SYNTHETIC.—Drugs which are produced by chemical processes in a laboratory are known as synthetic drugs. (*See also* DRUGS.)

SYPHILIS is a serious chronic disease which may be either "acquired" or "inherited." It is due to the entrance into the body of a special kind of germ, shaped like a corkscrew and having from ten to twenty-five spirals in its length. This germ was only discovered in the early part of this century, although the disease which it causes has been known since the Middle Ages. The germ is conveyed from one person to another most commonly through sexual intercourse, although it may (but exceptionally) enter the body if a person comes into accidental contact with such articles as towels or cups which have been used by someone suffering from the active disease, who has deposited material containing the germs upon them. In congenital syphilis the children are infected before birth by the mother, and therefore syphilis is not—strickly speaking—an *inherited* disease, as it is acquired by the unborn child whilst in the mother's womb.

Symptoms.—It is usual to describe the results of syphilitic infection in three stages. In the first stage, after infection has taken place about a month, a small hard, painless sore appears at the place where the germ gained entry to the body. The bottom of the sore is very hard and the surrounding parts feel hard also. A slight colourless discharge accompanies the sore, in which the germ can be found. The glands in the neighbourhood of this sore enlarge, though this enlargement may not be noticed by the patient as it is completely painless. If no treatment is carried out during the period when the sore is present, it gradually decreases in size, until at about the end of two months only a small scar remains. But during this time the germs have got into the blood and have been carried to all parts of the body. As soon as they are able to become active in the various organs of the body, the secondary stage of the disease may be said to have been reached. This usually happens in between two to three months from the time of infection.

In the secondary stage, symptoms of a general nature appear. There is nearly always severe headache, usually worse at night; slight fever; pains in joints and bones or there may be severe anæmia. But the chief and most obvious feature of the secondary stage of syphilis is a rash. This rash may imitate nearly every known skin disease, and without certain tests it may be very difficult to tell if the rash is due to syphilis or not. During the secondary stage of the disease the germs get into the nervous system and, although at this time there may be no symptoms of any disease of the nervous system, examination of the fluid which

surrounds the spinal cord, the cerebro-spinal fluid (q.v.) will show whether or not the particular person in the secondary stage is likely to suffer later from either of the two severe diseases of the nervous system caused by syphilis, namely, general paralysis of the insane (q.v.) or locomotor ataxia (q.v.). In this stage too, the germs invade the heart and walls of the blood-vessels, so that later on diseases of these important organs may occur, due to the effect of the activity of these germs. It is hardly necessary to stress, in view of what has been said of the later results of syphilis (which are responsible for a greater number of deaths and lives of chronic invalidism than the mildness of the disease in its early stages would suggest), that no one should allow the secondary, or if possible the first, stage of the disease to go untreated. But if left untreated, the secondary stage appears to clear up, and there is a period of freedom from symptoms which may last from two to twenty years; but, sooner or later, other symptoms arise and these form what is termed the tertiary or third stage of the disorder. During this period of freedom from symptoms the resistance of the body prevents further activity on the part of the germs which are, however, lying hidden away in all the organs of the body. Many of these germs die out in the course of years, but some remain alive, and at any time they may re-awaken to activity.

There is no organ which may not be attacked in the third, or tertiary, stage of syphilis. Generally speaking, the disease in this stage takes the form of the production of tumour-like masses which become soft in the middle and then become ulcers. These tumour-like masses are called gummas, and they vary in size from a pin-head to an orange. The ulcers which replace them are slow to heal unless properly treated. The skin, the bones and joints, the liver, the palate, the tongue, the mouth, are all common places where this ulceration occurs. The ulceration of the tongue is particularly dangerous as it is apt to be followed by cancer of the tongue. The end of the third stage of syphilis is often accompanied by disease of the large blood-vessel, the aorta (q.v.), whilst later still the germs which have been allowed to remain undestroyed in the brain and spinal cord, where they settled down during the secondary stage, become active and give rise to obvious symptoms of disease of the nervous system.

Treatment of Syphilis in Adults.—The importance of early treatment of the disease has already been stressed. But before treatment can be started, accurate recognition of the condition in its earliest stage is essential, and it should be the duty of everyone who notices a sore after exposure to infection to be examined by a doctor. If treatment is commenced early in the disease, by means of salvarsan (q.v.) or similar preparations of arsenic, before the germs have had time to get into the blood and spread themselves throughout the body, there is every reason to suppose that the disease may be really cured. But once the secondary stage has been reached and germs have managed to get hidden away in the various organs, there is always a danger that however energetic treatment may be, many germs may not be reached, and later on they may resume their activity. Fortunately there is a certain test, the Wassermann reaction, which can be carried out, which not only shows the doctor whether or not syphilis is present in a particular patient, but also tells him how the treatment is affecting the course of the disease. If no treatment has been given until the third stage of the disease has been reached, then salvarsan is of little value, and the older remedies of mercury and potassium iodide are the ones employed. The question of marriage is often a problem to the patient who has suffered from syphilis. It can be stated that during the first and secondary stages the disease is highly infectious, and an individual who married, even whilst undergoing treatment, in either of these stages would be committing a crime against the human race. In the tertiary stage the chances of infection are less, but they are still probable. It is impossible to lay down any fixed period after infection when it would be absolutely safe for an individual who has suffered from untreated syphilis to marry. With regard to patients who have been energetically treated, the doctor who has treated them is the one who is best able to judge when the disease has been stamped out; the earlier treatment is begun, the more likely the chance of complete cure.

Congenital Syphilis.—The children born of parents suffering from syphilis are liable to

show the symptoms of the later stages of the disease. In the children the disease is always generalized, and any part of the body may suffer. The bones, the skin, the joints, and the liver are commonly affected. The eyes may be attacked if the children survive the infant period, whilst a particularly complete form of deafness may occur in the early teens. The nervous system also may share in the general involvement of the body, and general paralysis of the insane is not uncommon in the victims of congenital syphilis, coming on from about the eleventh or twelfth year onwards. It is fortunate for humanity that women who suffer from syphilis are apt to miscarry, as otherwise congenital syphilis would be even more common than it is to-day.

Treatment of Congenital Syphilis.—The treatment of congenital syphilis really begins with the treatment of the mother whilst she is pregnant. If such treatment is vigorously carried out, there is every chance that a healthy child will be born. Once the child is born, the treatment follows the same lines as those of adults. Salvarsan or other arsenic compounds are well tolerated by children, and rubbing with mercury is also valuable; but the disease is so generalized in the victims of congenital syphilis that it is rare for a real cure to occur. Most of these children die in infancy; few reach adult life.

SYRINGE.—Syringes are used for injecting fluids into the body or into its passages and cavities. There is a variety of shapes and sizes of syringe, which may be used for different purposes. A very useful form of syringe is that known as Higginson's syringe, and it is chiefly used for giving enemas or for using as a vaginal douche, though it is also useful for douching the nose or the ear. For douching the ears or nose there also are rubber syringes with a round or pear-shaped bulb attached, sometimes with a bone or vulcanite nozzle. Hypodermic syringes are made in many sizes, and they are used for injecting drugs directly into the body under the skin or into a vein. Syringes should be capable of being thoroughly sterilized without being damaged.

SYRINGOMYELIA.—This is a disease of the spinal cord in which there is a new growth in the grey matter around the central canal. The symptoms vary a great deal with the extent of the disease. There is loss of sensation to touch and an inability to feel heat or cold, and a patient may burn himself without knowing it. Another symptom may be wasting of the muscles, and changes may take place in the fingers, etc. There is no effective treatment, but the disease develops very slowly. (*See also* SPINAL CORD.)

SYRUPS.—A mixture of sugar and water is frequently used with drugs in order to make them more pleasant to the taste. (*See also* DRUGS.)

SYSTOLE.—The contraction of the heart is described as its systole. (*See also* HEART.)

TABES.—This is an ancient Greek word which was used in medicine over two thousand years ago. It was used then to describe general wasting diseases, but it now means *tabes dorsalis* or *locomotor ataxia*, a nervous disorder caused by an old syphilitic infection of the spinal cord and brain. (*See also* LOCOMOTOR ATAXIA; SYPHILIS.)

TABLET.—Many drugs are compressed into the form of a tablet and in this form they are easy to handle and to carry about. Tabloid is merely another name for tablet, but is the registered trade mark of a firm of manufacturing chemists and can therefore only be applied to their products. (*See also* PILL.)

TACHYCARDIA.—Rapid action of the heart-beat in the absence of any obvious cause is described as tachycardia. (*See also* HEART; PULSE.)

TÆNIA.—This word means a band or ribbon, and the term tænia is applied to certain bands of nerve fibres in the brain. The term is also used in connection with a variety of tapeworms. (*See also* BRAIN, WORMS.)

TALC.—Talcum powder, or talc, consists chiefly of the silicate of magnesium. It is a very soothing dusting powder for the skin, and as it absorbs perspiration, it is especially useful for the feet and arm-pits. Sometimes an antiseptic, such as salicylic acid, is added to it. (*See also* MAGNESIUM.)

TALIPES.—Club-foot is a more popular name for this deformity. (*See* CLUB-FOOT.)

TAMARIND.—The fruit of this tree, which grows in Africa and the West Indies, contains tartaric acid and acid potassium tartrate. There are several preparations made from the fruit which act as a mild laxative. Tamarind water, made from an infusion of the fruit, is used as a cooling drink in fevers.

TAMPON.—A wad of cotton wool rolled into a ball and used for plugging one of the cavities of the body, is described as a tampon. Drugs such as glycerine, tannin and iodoform are often used along with the tampon. (*See also* SWAB.)

TANNIN.—Tannic acid, or tannin, is obtained from oak-galls and it is also present in several varieties of plants. When brought in touch with any tissue or mucous membrane, tannic acid draws it together and dries it up, and because of this action tannin is used in the treatment of ulcers, sores, and various moist eruptions. A solution of tannic acid sprayed over a burn will act as a protective covering. Tannin is also used as a styptic, which is the term used for any drug capable of stopping hæmorrhage. In this way it is employed in cases of bleeding from the bowel, gums, fissures and ulcers and it is also used in tonsillitis, pharyngitis and diarrhœa. Suppositories containing tannin are used for piles. (*See also* GALL.)

TAPEWORM.—*See* WORMS.

TAPPING.—This term is used to signify the removal of fluid from a body cavity or from the tissues under the skin. Many inflammations cause the rapid collecting of watery fluid as, for example, in the pleural cavity in wet pleurisy, and the pressure so caused may easily upset the work of a neighbouring organ, such as the lung and the heart in the example given. The fluid is actually removed by inserting a hollow needle attached to a syringe, or by a trocar and cannula, or by a special instrument called an aspirator.

TAR.—Prepared coal tar is used medicinally in the form of liquor carbonis and liquor carbonis detergens. These preparations have definite antiseptic properties and, applied externally to the skin, have a stimulating action. They are mildly anæsthetic and are valuable in relieving itching. In the treatment of psoriasis and chronic dermatitis a tar ointment is often prescribed and tar baths can also be utilized. Care must be taken in applying the ointments, as their excessive use may lead to irritation and blistering of the skin and in some cases to wart formation. Tar can be vaporized and the fumes inhaled to advantage by sufferers from chronic bronchitis. (*See also* PINE.)

TARSUS.—This is the collective name given to the seven bones which make up the ankle and adjacent part of the foot. (*See also* FOOT.)

TARTAR.—The deposit which collects round the necks and adjoining parts of the teeth is described as dental tartar. It is hard, firmly adherent, light brown in colour, and is derived from stagnating saliva or mucus on parts of the teeth not generally subject to friction. As it presses on the gum, it sets up inflammation, favouring the growth of germs and helping to produce pyorrhœa. Tartar should be regularly removed by scaling of the teeth. The eating of food requiring thorough chewing, and slightly acid in reaction—salad vegetables and fresh fruit—will help to prevent the formation of the deposits.

TARTAR, CREAM OF.—This substance is obtained from the deposits which form in wine casks during the fermentation of grape juice. Chemically it is known as acid potassium tartrate.

TARTAR EMETIC.—*See* ANTIMONY.

TARTARIC ACID.—Either in the form of free acid or of acid tartrate of potassium, tartaric acid is widely distributed in the vegetable kingdom, the most abundant source being the grape. Commercially, tartaric acid is manufactured from the acid tartrate of potassium and it occurs as colourless crystals which are easily soluble in water. It is chiefly used in combination with carbonates and bicarbonates for the production of effervescing and cooling drinks. The average dose is from 5 to 20 grains. Too large doses produce stomach irritation.

TASTE.—On the tongue are situated a number of fine nerve endings grouped together to form taste-buds. To stimulate these nerves the substance must be in solution, and the sensations aroused fall into four groups, viz. sweet, sour, salt and bitter. Sweetness is most appreciated by the tip of the tongue; sourness at the sides and bitterness at the back. It should be realized that the sense of smell is a powerful adjunct to the sense of taste. Flavours are often thought of as tastes, but actually they are really compound sensations of taste and

smell. This explains why a "cold in the head" renders the food tasteless.

Loss of taste (*ageusia*) may arise if the tongue is too dry—or if its surface is disordered by the presence of furring. It may also occur should any of the nerve paths which convey the taste sensations to the brain be injured or should the taste area in the brain be damaged. In the latter case, curious sensations of unpleasant tastes may result. Perversion of taste may occur in hysteria and in insanity. A bad taste in the mouth is most often a sequel to digestive disturbance, particularly constipation; more rarely it may arise when certain drugs such as mercury are taken. (*See also* SENSATION; SMELL; TONGUE.)

TATTOOING.—The only method of removing tattoo marks is by cutting out the tattooed skin.

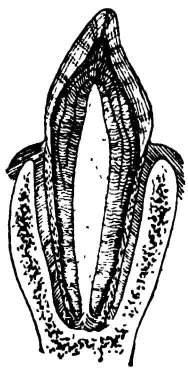
TEA.—Tea has no actual food value, though the alkaloid extracted from it, theine, is practically the same as caffeine, which is extracted from coffee, and is a fairly harmless stimulant.

It is not tea that is harmful to weak digestions, but the quantity of starchy foods, cake, etc., so often eaten with it. Those whose digestions are not in good working order would be wise to avoid "high teas."

Tea poisoning is not unknown as a consequence of too much habitual tea drinking. Faintness, low spirits and attacks of nervousness are symptoms of this condition. (*See* SUPPLEMENT ON DIET AND INVALID COOKERY.)

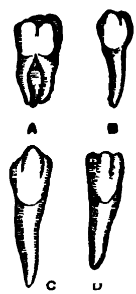
TEARS.—These are the watery and slightly salty drops of fluid which moisten the eyes and which are produced abundantly during grief as in weeping. They are secreted by the lachrymal glands, situated in the outer part of the orbit just above the eyeball. It is necessary for the cornea of the eye to be kept moist in order to preserve its transparency and the tears are carried across the eye by the blinking movements of the eyelids. The stream of tears also washes foreign bodies, e.g. dust, off the eyes, and has a slightly antiseptic action. Overflow of tears on the face (excepting during weeping) results when there is an obstruction to the tear passages leading to the nose. Children do not secrete tears at birth; this function is not established till three to four weeks of age. (*See also* EYE *and* LACHRYMAL APPARATUS.)

TEETH.—A tooth is made up of a crown, a neck and one or more roots or fangs. The greater part of the tooth is composed of dentine, or ivory, and over the crown there is a hard, brittle, white shell called enamel. The dentine surrounds a cavity containing the pulp. This consists of fine blood-vessels, nerves and connective tissue. On the top of the crown are two or more elevations or cups which aid the chewing of the food. The teeth are fixed in sockets in the upper and lower jaw-bones, and between the root of the tooth and the wall of the socket is a substance called the cement or crusta petrosa. The gum covers the borders of the jaw-bones, embraces the teeth at their necks and occupies the space between the teeth.



Structure of Tooth

In a grown-up person there are thirty-two teeth, eight on each side above and below. These are called the second or permanent teeth. The upper row consists of four incisors in the centre, sharp and chisel-shaped; on each side of the incisors is one pointed canine; next to the canines are two pre-molars; then there are three molars on each side. The bottom row is placed in the same way, each upper tooth having a similar one opposite to it. The incisors and canines are for cutting purposes, the pre-molars and molars, with their broad ridged tops, are for grinding the food. The so-called wisdom teeth are the last molars and they do not erupt till about the twenty-first year. Occasionally, they do not appear at all.



Different kinds of Teeth
A—Molar
B—Pre-molar
C—Canine
D—Incisor

The first or milk teeth are cut gradually, the first to appear being the lower central incisors about the sixth month. Then follow the upper central and lateral incisors, and, in this order, the first molars in the twelfth month, the canines in the eighteenth, and the second molars in the twenty-fourth month.

There is some degree of variation of the times of eruption even in normal children, but in rickety children, dentition is very much delayed. The second dentition begins to appear about the sixth year with the appearance of the first permanent molars and each year after this the other permanent teeth are cut; the central incisors, the lateral incisors, the first pre-molar, the second pre-molar, the canines, and the second molars.

Teething is often accompanied by unpleasant symptoms in the young child. The gums may become hot, swollen and tender and the child is feverish, irritable and restless. Not infrequently, the digestion is upset; there may be constipation or diarrhœa, and spots may appear on the skin. Bronchitis is another possible complication and occasionally convulsions may arise in an unstable child. Teething difficulties should not require the child to be taken off the breast. Cool boiled water should be given to relieve the hot gums and fluid magnesia to relieve constipation. It is no longer considered good medical practice to lance the gums. In the intervals between eruption of the teeth, hard crusts or slices of hard apple should be given to the child to facilitate cutting through the gums. This practice helps also to develop the jaws and so tends to prevent overcrowding of the teeth with their subsequent deformity and irregularity. If the teeth are overcrowded, the only remedy is extraction of the offending tooth or teeth. Another important aid to proper jaw development is breast feeding; the vigorous suction required is the natural and best stimulus to growth and expansion of the jaw-bones.

Note.—The constant use of a baby's comforter is strongly to be condemned.

Care of the Teeth.—Diseased teeth and gums may be responsible for many grave diseases, rheumatism, anæmia, stomach disorders, etc., therefore great effort should be made to maintain them in a healthy condition. Visits to the dentist should commence from the first year and be continued at regular intervals throughout life. Tooth and gum brushing should be practised from childhood, regularly twice a day—night and morning—and there should be a sufficiency of lime and vitamin foods in the dietary, for these are essential for the correct nutrition and growth of the teeth. Such foods are milk, wholemeal cereals, fruits, green vegetables and dairy produce generally. Caries (dental decay) and pyorrhœa (gum suppuration) are always a result of faulty hygiene of the teeth.

Pain in a tooth, or tooth-ache, may be due to exposure of the sensitive pulp through caries. If a cavity is obvious, to relieve the pain a little flat pad of cotton-wool soaked in oil of cloves should be applied temporarily. It is the painless type of abscess at the roots of the teeth which are most liable to cause disease in other parts of the body. These abscesses are little poison factories fouling the blood-stream and removal of the tooth is the only remedy. Very often it requires an X-ray photograph to detect the offending tooth.

To Stop Bleeding After Extraction.—Excessive bleeding after a tooth is extracted may be stopped by plugging the socket after removing all clots with a pad of cotton-wool soaked in very cold or very hot water or, if available, peroxide of hydrogen.

Care of Artificial Teeth.—Those who wear artificial teeth should strive to keep the mouth clean and healthy. The teeth should be removed after every meal and the denture brushed with a mild antiseptic lotion. The mouth ought also to be rinsed and any natural teeth brushed. For a vulcanite plate hydrogen peroxide makes a pleasant lotion; but for a metal plate a weak solution of chlorinated water will be necessary to keep the metal bright. Tooth powders should not be used for artificial teeth as they tend to remove the polish. The surface is best cleaned with soap on a cloth rubbed vigorously the long way of the tooth.

TELANGIECTASIS.—Term used to denote dilatation of the small blood-vessels in the skin. It is seen most commonly on the face in a localized area and has the appearance of a birth mark. A variety resulting from exposure to the weather, or from a local injury such as a sharp blow or the bite of an insect is called a "spider nævus." If the patches of telangiectasis are not very large, they can be removed by carbonic acid snow or radium. It is inadvisable to use caustics for this purpose. (*See also* BIRTHMARKS.)

TEMPERATURE.—The degree of heat or coldness of any substance or body is known as its temperature. The body temperature of man is remarkably constant in health,

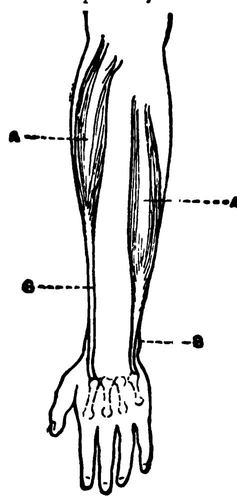
being about 98·4° F. There is a daily variation of about 1° F., the highest level being reached in the evening. After a meal or hard exercise, the temperature may be raised slightly. Regulation of the body temperature is under control of the brain. Heat is produced chiefly in the muscles and larger organs, and it is got rid of by radiation and conduction from the skin and by sweating. A balance is maintained between heat production and heat loss. If a large amount of heat is produced the skin vessels relax and dilate, more blood passes to the surface of the body and is so cooled; also, sweating takes place and the evaporation of sweat on the skin cools the circulating blood.

Disease may upset the temperature regulating mechanism in the brain and the temperature may rise or fall much below normal. Poisons from germs are liable to affect the temperature centre and raised temperature or fever results. This fever is really a protective response on the part of the body, as a high temperature hinders the activities of the germs. In certain diseases, notably general paralysis of the insane, high temperatures are produced artificially, e.g. by malarial infection, in order to relieve the symptoms of the disease. An exceedingly high temperature—above 100° F.—is called hyperpyrexia and this indicates a dangerous state of affairs. A subnormal temperature below 96° F. may be evidence of shock or collapse and may be almost equally dangerous. The temperature of the body is measured by means of the clinical thermometer.

TEMPORAL BONE.—This bone takes part in the formation of the temple, but is more important as having the internal ear placed deeply in it, protected by the mastoid air cells. It is irregularly shaped and is made up of several parts. There is a thin plate-like portion which helps to close in the side wall of the skull. Below and behind this part it becomes thickened to joint with the occipital or base bone of the skull and is projected downwards to form the mastoid process. This process forms an attachment for the powerful sternomastoid muscle. Above and in front of this process is the opening of the bony part of the outer ear passage, and forwards there is a thin piece of bone called the styloid process giving attachment to various muscles.

Projecting in front of the ear opening is the zygomatic process which helps to form the arch of the cheek. Beneath the back part of this process is the joint surface for the mandible or lower jaw. Another portion of the temporal bone is directed inwards and forms part of the base of the skull. It is pear-shaped and contains the internal ear while the internal carotid artery runs through a part of this bone.

TENDERNESS.—When pressure on a part of the body produces a sore painful sensation the part is said to be tender. Often tenderness is associated with inflammation. Sometimes it may be of hysterical origin; this is specially so in the case of tenderness in the head and spine. Muscle tenderness may be due to injury, but very often it is caused by a rheumatic inflammation.



Tendon
A—Muscle B—Tendon

TENDON. — The white fibrous structure which connects a muscle to the bone is termed a tendon. Its fibres are tough and strong and do not give much. Tendons vary in their shape; they may be rounded like cords —long and slender as in the limbs, while others may be flat and sheet-like as in the case of the abdominal (belly) muscle. Where it passes over a bone, a tendon usually runs in a fibrous sheath lined with a smooth moist membrane. Small bones may develop in the tendon (sesamoid bones), the knee-cap being an example of this.

The tendons of the wrist and hand are sometimes subject to acute inflammation especially following a poisoned wound of the thumb or little finger. This condition is called teno-synovitis. Teno-synovitis may also arise as a result of rheumatic disease. Occasionally, the tendon of the heel (teno-Achilles) may be snapped by a sudden severe strain. The muscles tend to pull the severed ends apart and an operation becomes necessary to join them together again. In some deformities of the feet, it may be

necessary to sever tendons, an operation called tenotomy.

TENDON JERK is the response caused by the contraction of a muscle when the tendon is tapped briskly. The knee jerk is an example of this and its presence denotes that the nerve continuity to and from the spinal cord is intact.

TENESMUS.—Painful, spasmodic, frequent straining to empty the bowel, usually ineffectual, is termed tenesmus. Sometimes a little blood or mucus is passed. It may arise when the bowel is loaded with hard masses of fæces, or it may be provoked by a fissure of the anus or a growth in the rectum. Tenesmus is quite frequently caused by diarrhœa, particularly the diarrhœa associated with dysentery. In young children it may be produced by worms in the bowel or it may be caused by intussusception. In this latter condition the infant has fits of screaming and blood and slime are passed. A similar condition may arise in the bladder, known also as stranguary or dysuria, due to a very acid urine, gravel or inflammation.

TENNIS ELBOW.—This injury is most frequently caused by playing tennis though it can easily be caused otherwise. The pain may arise suddenly during a game or it may develop slowly. It is felt on the outer side of the front of the elbow and runs down the arm, rendering it impossible to use the arm. Back-hand strokes at tennis are more liable to cause this disability than forehand. There is usually a particularly tender spot below the bony prominence on the outer side of the elbow. With rest there is a temporary recovery, but when play is resumed the symptoms are apt to recur.

The cause of tennis elbow is either a small rupture of some of the fibres of the muscles which extend to the wrist and fingers, or an inflammation of a small bursa or bag which exists between these muscles and the head of the radius bone which rotates underneath.

Treatment.—Immediate treatment is to apply a firm pad to the painful spot and control it with strapping. Rest is essential and it is generally necessary to discover if there is any small area (focus) of germ infection in the body (i.e. teeth or tonsils), for a permanent cure will not be obtained until such focus is eradicated. In some cases a minor operation for the removal of the bursa may be necessary. (*See also* Bursitis.)

TENOTOMY.—*See* Tendon.

TENT.—In medicine, an instrument used to dilate an orifice of the body is termed a tent. It is a small rod-like article, made of compound absorbent material such as seaweed or tupelo-wood, which swells up in the presence of moisture and so slowly widens the opening. Tents are sometimes used to dilate the opening of the neck of the womb.

TERATOMA.—This is tumour or growth which contains developmental (embryonic) remains such as teeth, hair and muscle. It is derived from the primitive cell layers of the embryo and the cause of its development is obscure. Most often this tumour is found in the genital (sex) organs, e.g. the testicle or ovary. Such tumours are easy to remove by surgical operation.

TEREBENE.—This is a colourless liquid with a pleasant smell of freshly sawn pine and an aromatic taste. It is prepared from oil of turpentine and it is antiseptic, disinfectant and deodorant. It is used as a stimulating medicine in chronic bronchitis and pulmonary tuberculosis. Terebene may be employed as a spray or inhalation, or in small doses by the mouth in an emulsion, in capsules or on sugar. Sometimes, it is used internally as an intestinal disinfectant in dysentery. During treatment with terebene, the urine must be carefully watched, as the drug may irritate the kidneys and cause albumen and blood to be passed.

TERTIAN FEVER.—A variety of the tropical fever called Malaria. (*See also* Malaria.)

TESTICLE.—The testicle is the male sex gland and corresponds to the ovary in the female. There are two, a right and a left, each occupying a compartment in the scrotum, a purse-like bag. The testicles develop originally in the cavity of the abdomen (belly), and just before or after birth reach the scrotum. The testicle has a complicated journey to make before it finally arrives at the scrotum and it carries with it a tube-like process of the lining of the abdomen (the peritoneum) which becomes closed at its upper end and which covers the testicles in front and at the sides. This lining is called the *tunica vaginalis* and, being smooth, it diminishes any friction that might arise from the movements of the testicles. Sometimes fluid collects in the bag, a condition called *hydrocele*.

Not infrequently, one or other of the

testicles may fail to descend completely. They may remain in the abdomen, or just above the entrance to the scrotum (in the inguinal canal). Such a condition is described as an "undescended testicle," and, should both testicles remain in the abdomen, the individual concerned is called a "cryptorchid." If the testicles are in the inguinal canal they may descend at puberty (about fourteen years), but sometimes an operation is necessary. Should the testicles remain in the abdomen, they do not develop properly and the mature sex characteristics do not become manifest. With undescended testicles there is also a danger of an accompanying hernia (rupture), and in such a case an operation is essential to cure the defect. Undescended testicles are more liable to become involved in malignant growths than is normally the case.

The testicle produces sperm cells or spermatozoa. These are the male seeds which, when they fertilize the female eggs, produce a new individual. The sperms are contained in small tubes and make their way along a number of small ducts to reach the main duct of the testicle, called the vas deferens. This leads to the seminal vesicle (reservoir), from which the sperms are discharged during sexual intercourse. In addition to this function, however, the testicle has yet another equally important function. Certain cells (interstitial cells) in the gland produce a secretion which is passed directly into the blood-stream, called an "internal secretion," and it is this secretion which is responsible for the development of the mature sex characters. Absence of the secretion, which may arise after castration (removal of testicles), causes the individual to remain boyish in figure; the skin is smooth and hairless, penis small, voice high-pitched, and there is a tendency to fatness. Such a person is described as a eunuch.

Inflammation of the body of the testicle is called *orchitis* and of the upper tubular portion *epididymitis.* This condition is liable to arise as a complication of mumps and it is a common sequel to gonorrhœal infection. The testicle becomes swollen, painful and tender. Treatment is rest in bed, support for the testicle by raising it on a pillow, and hot or cold applications. A good purge is also advisable. Chronic inflammation of the testicle may follow acute attacks or arise from syphilis or tuberculosis. The gland tends to break down, becomes adherent to the scrotum, and may ultimately discharge through the skin. Treatment depends upon the cause. In some cases the testicle may require to be removed by operation. Injuries to the testicles from kicks, etc., cause a sickening pain and may lead to dangerous shock. (*See also* EPIDIDYMIS; HYDROCELE; SCROTUM; SPERMATIC CORD; VARICOCELE.)

TEST MEAL.—A meal given to obtain information concerning the digestive function is described as a test meal. Generally the patient takes a light supper and, first thing in the morning, a stomach tube is passed and the stomach contents, if any, drawn off for examination. If food is present it is evidence of stagnation in the stomach. Then the meal is given: it consists of two slices of toast and two cups of weak tea. One hour afterwards the stomach contents are drawn off and their examination reveals much useful information to the physician, especially with regard to the quantity and quality of the stomach secretion. Another method is to carry out a fractional test, i.e. successive portions of the contents are withdrawn from the stomach at fifteen-minute intervals. Opaque meals, consisting of bismuth carbonate or barium sulphate along with milk, bread and cornflour, are given before X-ray examination to determine the position, size and shape of the stomach and the rapidity with which a meal passes down the digestive tract.

TETANUS.—Tetanus, which is more commonly known as lockjaw, is due to a germ which enters the body and sets up a condition of contraction in the muscles, usually commencing in the jaw and neck, but gradually affecting the rest of the body. The germ is found in soil, and as it is extremely resistant to the effects of heat and cold it may go on living for years. It is even resistant to the effects of ordinary antiseptics, so it is easy to understand that such powers of resistance make the wiping out of tetanus a difficul problem. The germ lives in the intestines of horses and cattle, and any manured soil is liable to become infected For the development of tetanus it is neces sary that there should be some opening in the skin through which the germ can gain entrance to the body and the wound must come in touch with the germ through soil. At the beginning of the War, numerous cases

occurred, but preventive measures were taken by injecting all cases of wounds with anti-tetanic serum.

Symptoms.—Symptoms usually begin to appear seven or eight days after infection of the wound, but the longer the symptoms take to appear, the better the chances are of recovery. The first signs of the disease are stiffness of the throat muscles, with difficulty in swallowing. The patient has difficulty in opening the mouth, and gradually the neighbouring muscles begin to contract, giving the face a peculiar expression. The spasm extends to the muscles of the back, chest, abdomen and limbs, and the patient has frequently recurring seizures which are terrible to watch. The skin is moist or sweating, but the patient never loses consciousness and is unhappily aware of his serious condition. In *local tetanus*, the contractions are limited to the muscles surrounding the wound but such cases never become severe. *Tetanus neonatorum* may occur in new-born infants, the symptoms showing themselves within a week or so of birth. Infection usually takes place through the severed umbilical cord and convulsions may be the first sign of the disease.

Treatment.—The early administration of anti-tetanic serum should be carried out in any case of a wound which may have been contaminated by soil. Once the symptoms of tetanus appear much larger doses are given, and they should be injected into the spinal canal or into the skull cavity. Various drugs are given to relieve the spasms and to allow the patient to take nourishment. Only liquid food is given and a feeding-tube may be used if necessary. The patient must be kept absolutely quiet in a darkened room as the slightest disturbance is liable to cause a spasm. When the spasms are very severe, relief may be given with inhalations of chloroform. (*See also* SERUMS.)

TETANY.—This is an affection in which there arise spasms of certain muscles. It is due to over-excitability of the nervous system. The muscles most often affected are those of the arms and hands. The elbows and wrist. are bent, and the fingers squeezed together. Sometimes the lower limbs are similarly affected and occasionally the face. In children, rickets is the chief cause especially if it is associated with some derangement of digestion. In adults the condition arises also in connection with dilatation or sagging of the stomach and it follows removal of the parathyroid glands, tiny structures situated in the thyroid gland in the neck. The actual disorder is believed to be due to some disturbance of the calcium (lime) salts in the blood. The spasms may occur spontaneously or may be brought about by slight irritation of the nerves from pressure or any other cause.

Treatment of tetany in the child calls for the remedying of the co-existing rickets. Sunshine, ultra-violet rays, cod-liver oil and nourishing food generally are indicated. Large doses of calcium chloride also help. Occasionally, it may be necessary to prescribe small doses of a nerve sedative such as chloral hydrate. In adults, attention to the digestive system by dieting and relief of constipation are essential to cure the condition. Extract of parathyroid gland with calcium is also given for this affection. (*See also* RICKETS.)

TETRONAL.—This drug belongs to the hypnotic, i.e. sleep-producing, class which also includes sulphonal, trional and chloral hydrate. It is one of the most powerful of the group. Tetronal is given in 10–20 grains doses and, as it is slowly absorbed, it should be taken about two hours before its effects are desired. It is not a drug which lends itself easily to the formation of a habit.

TETTER.—This is an old Anglo-Saxon word popularly used to describe a great variety of skin diseases in man and in animals. It is generally qualified by the use of adjectives, e.g. scaly tetter, blistered tetter, crusted tetter, and so on.

THEOBROMA.—This is cacao butter, or oil of theobroma, and it is an oil expressed from the seeds of a plant cultivated in Mexico and Demerara. It is a yellowish solid oil, of the consistency of tallow and having an aroma similar to chocolate. It is used in the making of suppositories and pessaries. Theobroma has the advantage of not becoming rancid on exposure to air. The alkaloid (active principle) is theobromine and it is similar to the caffein of tea and coffee, having a stimulating action on the heart and increasing the secretion of urine. (*See also* DIURETIC.)

THERAPEUTICS.—This word signifies the branch of medicine which deals with the treatment and cure of the sick in all aspects.

THERMO-CAUTERY.—This is an instrument for burning or destroying useless tissues, e.g. tumours, in the body. There are many varieties, Pacquelin's being a type in which a platinum point, first heated over a spirit-lamp, is kept hot by pumping benzine vapour through it. Nowadays, electrical types are generally used. These consist of a handle through which wires carrying an electrical current are led and to which various platinum burners—pointed, blunt or flattened like a knife—are attached. The cautery is useful for removing polypi and for arresting bleeding.

THERMOMETER.—This is an instrument for recording and measuring temperature. The essential part is a substance which expands under the influence of heat and the substance most commonly used is mercury. When it is desired to measure very low temperature, a spirit (alcohol) thermometer is used. The instrument consists of a small glass bulb, the reservoir for the mercury, connected with a glass tube to which is attached a graduated scale. No air must be present in the tube, which is sealed.

To graduate the thermometer, two fixed points are determined, the freezing point of water and its boiling point. The graduation between these points is arranged in three recognized scales. In Great Britain we use the Fahrenheit scale, the freezing point being fixed at 32° and boiling point at 212°. On the Continent the Centigrade and Réaumur scales are used; in the first the freezing point is 0, or zero, and the boiling point 100°; in the second the freezing point is also 0, but the boiling point is fixed at 80°.

To convert the Fahrenheit scale to Centigrade, subtract 32, divide by 9 and multiply by 5; to convert Centigrade to Fahrenheit, divide by 5, multiply by 9 and add 32.

The instrument used to take the temperature of the body is called the clinical thermometer. It is generally graduated from 95° to 110° in the Fahrenheit scale, each degree being divided into fifths, corresponding to the decimal ·2. In some varieties the glass in front magnifies, and so renders the reading of the thermometer easier. Normal body temperature, 98·4°, is generally marked with an arrow.

Taking the Temperature.—First cleanse the instrument by placing in an antiseptic such as carbolic lotion and then wash in ordinary water. Shake the thermometer *vigorously* to make sure that the mercury is well below the normal mark. In an adult the temperature is generally taken in the mouth or armpit, and in the child in the groin with the thigh folded upon the abdomen. It may also be taken in the rectum. In the mouth, the thermometer should be placed just under the tip of the tongue and the lips kept tightly closed. In the armpit, it is important to ensure that the skin surfaces are quite dry and that no clothing is allowed to lie between the bulb and the skin. Leave the thermometer in position for at least two minutes. Some thermometers are less sensitive than others—so it is well to make sure of getting the correct reading by leaving the instrument in position a sufficiently long time. After use the thermometer should be rinsed in antiseptic, shaken down, and either returned to its case, or placed in a little jar, with a plug of wool at the bottom to prevent breakage, and containing some antiseptic lotion. (*See also* TEMPERATURE.)

THIGH.—That part of the lower limb from the hip to the knee is described as the thigh. The large bone of this region is called the femur and it is clothed with large and powerful muscles. In front are the quadriceps which straighten the leg at the knee, behind are the hamstrings which bend the knee, and on the inner side are the adductor muscles passing from the haunch bone to the femur and serving to adduct or bring the thigh towards its fellow. All the muscles are enclosed in a strong fibrous sheath from which partitions arise and pass between the different muscles. In men, the outlines of the various muscles are visible to the eye; but in women the greater amount of fat under the skin obscures them. There are two other very important structures in the thigh, the femoral artery and the sciatic nerve. The main artery enters about the middle of the groin, where it can be compressed against the bone in an emergency, and runs down to the inner side of the knee where it passes behind into the space behind the knee. The sciatic nerve, the largest in the body, runs down the middle of the back of the thigh and in the lower part divides into two branches.. Painful conditions of this nerve are called sciatica; frequently this affection is of rheumatic origin, but it may, though less frequently. arise from some pressure within the pelvis,

THINNESS.—Excessive thinness may be an evidence of disease especially if it arises more or less suddenly. In such cases the doctor should always be consulted, for loss of weight may be caused by such grave diseases as consumption, diabetes, kidney disease and cancer. Thinness in healthy persons can often be overcome by correct exercises and by attention to the diet. The intake of carbohydrates (starchy foods) and of fats will require to be increased. Anxiety is often a cause of thinness and every effort should be made to overcome this factor as it has a very harmful effect upon body health.

THIRST.—This is the expression of the need of the body for replenishment with fluid. The sensation is associated with dryness of the throat and mouth. During the 24 hours the kidneys get rid of about 2½ pints of water, while the lungs and skin lose considerable quantities. Therefore, to make good the loss fresh supplies of fluid are needed and thirst is the signal that this is necessary. Thirst arises markedly when vigorous muscular exercise is taken owing to the excretion of sweat; it is very intense if a large quantity of blood is lost from any cause, or after profuse watery diarrhœa as in cholera. In fevers, thirst is generally a prominent symptom owing to increased heat production and sweating. The thirst which follows the taking of salt or sugar is an indication of the need for dilution of those substances in the digestive tract and the blood.

Inadequate water drinking is a cause of constipation. People engaged in occupations where there is great heat usually find oatmeal or barley water more efficacious as a thirst quencher than plain water, as such drinks hinder the throat and mouth from becoming dry so quickly as when plain water is drunk. Iced drinks should always be used in moderation as the stomach may easily be upset by the extreme cold. (*See also* Diet.)

THOMSEN'S DISEASE.—This condition is called after the Danish physician who first described it. Technically, it is known as *Myotonia congenita,* and it is shown by stiffness of the muscles on voluntary movement. There is a delay in carrying out muscular actions, in some cases the muscles becoming rigid. In a few seconds this rigidity passes and the muscles can be used again quite normally. The spasms are most marked in the limbs, and emotion aggravates the affection. The cause is unknown, but it is believed to be associated with excessive excitability of the muscle fibres. The disease first shows itself in childhood and usually several members of the same family are affected. No cure is known, but massage and gymnastic exercises often produce beneficial results.

THORACIC DUCT.—This is the main lymphatic channel of the body. It is a tube about 18 in. long, commencing in the upper part of the abdominal cavity and passing upwards through the diaphragm, thence through the thorax or chest cavity to reach the root of the neck where it joins the junction of the two large veins, the left internal jugular and the left subclavian veins. The lower extremity is dilated in the form of a small cistern, called the *receptaculum chyli,* which receives the lymph derived from the lower part of the body and the intestines. It is by the thoracic duct that a great deal of the nourishment derived from the intestines reaches the blood-stream. Poisons absorbed from the intestines may also gain access to the blood-stream through this channel. The thoracic duct also gathers lymph from the left side of the chest and the left side of the neck and head. There is a much smaller tube, the right lymphatic duct, which gathers lymph from the right side of the upper part of the body.

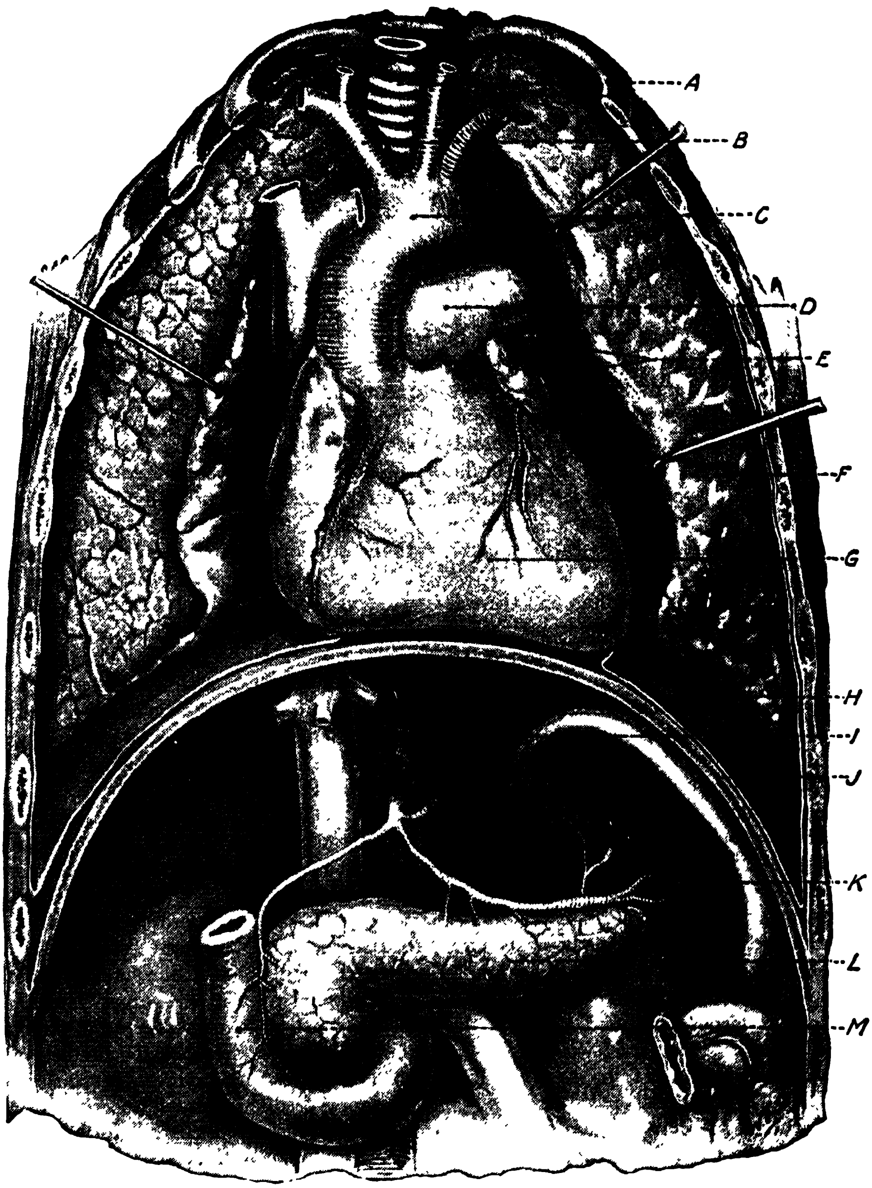
THORAX.—The bony cage forming the skeleton of the upper part of the trunk is called, in anatomy, the thorax. It is bounded in front by the sternum or breast-bone, behind by the vertebral column and at the sides by the ribs. Separating it from the abdomen is the diaphragm muscle. The operation of withdrawing fluid from the thoracic cavity is termed *thoracentesis,* while the operation of removing portions of ribs to enable the lung to collapse is termed *thoracoplasty.* (*See also* Chest; Lung; Pleura.)

THREAD WORM.—*See* Worm.

THROAT.—This region is limited in medicine to the upper part of the digestive canal, from the tonsils to the beginning of the œsophagus or gullet. It is described as the pharynx, and is dealt with under that heading.

THROBBING.—*See* Palpitation and Pulsation.

THROMBOSIS.—This term refers to the clotting of blood within the heart or blood-



THE THORAX AND UPPER PART OF THE ABDOMEN

A—Trachea or Windpipe
B—Innominate Artery
C—Aorta
D—Pulmonary Artery
E—Pulmonary Veins
F—Lung
G—Heart
H—Pleura
I—Abdominal Aorta
J—Diaphragm
K—Spleen
L—Pancreas
M—Duodenum

vessels during life and the clot is itself described as a thrombus. Healthy blood does not clot in healthy vessels, but if the circulation is slow or if there is any roughening in the vessel walls, or if there are certain blood changes, clots readily form and tend to grow and extend to where the blocked vessel joins a larger one.

Symptoms.—These depend upon the stopping of the blood supply. In some cases, thrombosis is beneficial, as in aneurysm where there is a dilatation of an artery and the walls are consequently weakened. In this condition the clot tends to strengthen the arterial wall and prevent its rupture. In general, however, the effects of thrombosis are harmful. If it occurs in the leg, pain, swelling and disablement arise. Vein thrombosis in the leg sometimes occurs after childbirth or during typhoid fever. In the brain, thrombosis leads to some degree of paralysis which tends to become more extensive, while in the heart thrombosis may cause sudden death.

Sometimes a clot may soften and there is a danger that a small piece may be washed off and carried to a distant organ to block a blood-vessel. This is called embolism. Should there be any infection in the clot, the septic fragments may give rise to abscesses in various parts of the body, a grave state of affairs. In other cases, the clot may be converted into scar or fibrous tissue, obliterating completely the aperture of the blood-vessel. It is in this way that a varicose vein may be cured naturally.

Treatment naturally depends upon the cause. The immediate remedy is rest for the affected part. In the case of a limb, it should be well-padded with cotton-wool and the patient is not permitted to move the limb. Over a tender and swollen vein an ice-bag may give relief from the pain. (*See also* Embolism; Pyæmia; White Leg.)

THRUSH.—This is an inflammatory disease of the mouth and throat occurring chiefly in delicate and poorly nourished children. It is due to an infection with a fungus, called *oidium albicans*, and it shows itself as greyish-white patches scattered over the mouth. Tenderness of the mouth, digestive disturbance, diarrhœa with green stools, and general irritability are the chief symptoms. Occasionally, the disease may spread to the stomach and intestines and it may infect the vagina. Cleanliness and the use of an antiseptic lotion, weak peroxide of hydrogen, along with a purge of castor oil, are the main methods of treatment.

THUMB.—The thumb is the most movable of all the digits. There are only two segments as compared with three in the case of the fingers, but the metacarpal bone moves very freely on the wrist bones, while those of the fingers are much more restricted. Certain muscles in the forearm move the thumb, but there is also a small group of muscles forming the ball of the thumb, called the thenar muscles, which widens the range of muscular activities of the thumb. The utility of the thumb depends upon its free range of movements and its power to oppose the other fingers. Therefore every effort is made to save the whole or even a small portion of the thumb should it be injured. Loss of the thumb is one of the most crippling accidents that can occur to the hand. Whitlows sometimes develop in the thumb and there is always danger of spread of infection to the wrist. Dislocation of the thumb is usually a backward one and its reduction often gives rise to considerable difficulty. The thumb is very well supplied with blood-vessels and bleeds freely if cut. A firm bandage wound round the thumb from the tip upwards will generally control the bleeding temporarily. (*See also* Finger; Hand.)

THYMOL.—This is a crystalline substance with the odour of thyme and a burning taste. It is obtained from the essential oil of thyme, horsemint and other plants, and it is a powerful antiseptic; it is of specific value in the treatment of hookworm disease and it is given in large doses to the fasting patient and followed by a saline purge. No oil or alcohol must be taken at the same time, as these dissolve the thymol and cause its rapid absorption with the danger of poisoning. Thymol is used in saturated watery solutions for mouth washes, gargles and lotions. Dissolved in alcohol, it can be used as an inhalation in nasal and bronchial catarrhs.

THYMUS GLAND.—This is a pear-shaped gland with the point upwards, consisting of a right and left lobe, situated in the chest immediately beneath the breast-bone. It extends upwards into the neck and its base lies upon the heart. Under the microscope, the thymus is seen to consist of masses of lymphocytes (white blood cells) with groups

of characteristic cells arranged concentrically called Hassall's corpuscles. Before birth there are two ducts connected with the gland but these become closed and disappear. The gland grows until about the age of puberty (14 years) and then withers, being replaced by fat and fibrous tissue.

As with other lymphoid tissues, the thymus manufactures white blood cells; but its other functions are a matter of doubt. There appears definitely to be some connection between the thymus and the sex glands. Removal of the sex glands causes persistence of the thymus and when the thymus is unduly enlarged (Status lymphaticus) the sex development is delayed. It would appear as if the secretion of the thymus gland restricts and controls the activities of the sex glands and prevents their precocious development. (*See also* STATUS LYMPHATICUS.)

THYROID CARTILAGE.—This cartilage consists of two plates of gristle encasing the main part of the larynx. The meeting-point of the plates forms the prominence of the neck called the "Adam's Apple." (*See also* LARYNX.)

THYROID EXTRACT.—This extract is obtained from the fresh thyroid glands of sheep which are dried and reduced to a powder. The extract is standardized to contain a definite percentage of iodine and it is usually employed in tablet form. It is also available in the form of a liquor. Thyroid extract is used extensively in medical practice, particularly in the treatment of thyroid deficiency in children (cretinism) and in the same condition in adults (myxœdema). Occasionally it is taken in the treatment of obesity, but in all cases it must be used with care and under a doctor's control.

THYROID GLAND.—The thyroid gland belongs to the endocrine system or "ductless" glands of internal secretion. It is situated in the neck and consists of two lobes with a narrow portion (isthmus) joining them together. Each lobe is about two inches long and lies alongside the larynx and upper part of the windpipe. The gland is attached to the cricoid cartilage so that it moves up and down in the act of swallowing. Under the microscope, the thyroid gland is seen to consist of a great many little spaces lined with cube-shaped cells and containing an opaque substance (the colloid secretion of the gland). This secretion is absorbed directly into the blood-stream, the blood-supply of the gland being particularly liberal for its size.

The secretion of the thyroid gland, called thyroxin, has a very important effect upon the whole body. It controls the building-up and breaking-down processes (metabolism). It speeds up these processes or slows them down according to the amount of secretion which passes into the blood-stream. Failure of the thyroid gland from birth or an early age leads to a breakdown in development, and the child is stunted in mind and body. This condition is called cretinism and it occurs in all degrees of severity. The cretin is dwarfed, with thick harsh skin, scanty hair, protuberant belly, and is intellectually dull, sometimes to the extent of idiocy. If replacement of the deficient secretion by thyroid extract is commenced sufficiently early, good results are obtained.

In adults, particularly women, a deficiency of the secretion of the gland may occur about the period of the change of life. The woman becomes heavy in mind and body, the hair falls out and the skin becomes coarse. Early treatment with thyroid extract is very beneficial. In contrast, excessive secretion of the thyroid gland causes the disease known as *exophthalmic goitre.* In this condition, there is over-excitability of all the organs, including the brain. The pulse is rapid, the eyes are prominent and staring, the skin warm and moist, and there is a marked tremor of the hands and fingers. The gland in the neck is quite obviously enlarged.

Goitre is the general name given to any enlargement of the thyroid gland whether accompanied by increase of the internal secretion or not. A simple goitre of slight degree is common in young women and not of much importance. (*See also* CRETINISM; DUCTLESS GLANDS; ENDOCRINE GOITRE; MYXŒDEMA.)

TIBIA.—This is the shin-bone and it is the larger of the two bones of the lower leg. The bone is triangular in section, ending above in two expansions which joint with the thigh-bone and below by forming the inner prominence of the ankle. The greater part of the tibia is immediately under the skin and can be felt by the finger.

Owing to its exposed position, the tibia is frequently subject to blows and kicks which

may result in fracture of the shaft. Such a fracture is usually oblique and not infrequently compound, i.e. the skin is broken and a portion of the bone may protrude. Inflammation of the surrounding membrane of the bone, periostitis, or of the bone itself, osteomyelitis, is a fairly common disease. The tibia may also be affected in rickets, and, becoming curved, is described as a sabre shin. Syphilis and tuberculosis sometimes involve the tibia. (*See also* FIBULA; LEG.)

TIC is a movement which is repeated time after time without any definite cause or object, and which is due to a neurosis (q.v.). A tic usually represents a movement which would be useful in its proper place, and the beginning of a tic (or habit spasm, as it is often called) can often be traced to the continued performance of a movement which at one time was made with a definite and proper purpose. For example, a tic of blinking the eyes may result from bad sight which has been corrected by glasses or from some injury to the eye. Normally, these movements should stop when the causes which called them forth are removed, but in nervous people, especially in nervous children, the movements become a habit and keep on for a very long time.

Mimicry is a very important cause; or a tic may arise as a result of overwork or general ill health, in which case it usually disappears as the general health improves. The types of tic which may occur are very large in number. Simple tics like sniffing or blinking are the most common but quite complicated movements of the arms and face may take place. The movements are generally quick, and consist of short spasms, which are something like the movements from an electric shock. They usually occur in bouts, and any attempt to control the impulse calls for a great effort which can only be made for a very short time and is then followed by a specially severe series of movements. During sleep a tic usually disappears. In children there is apt to be confusion between the movements of a simple tic and those of St. Vitus's dance (q.v.). In view of the great importance of recognizing the latter condition, any child who has uncontrollable movements for more than a few days should be seen by a doctor. In St. Vitus's dance, however, it may be noted, the same movement is never repeated twice running; in a tic it is the same movement that is repeated over and over again. The treatment of tics is difficult, especially in adults. In children, wholesome neglect of the habit, attention to the general health and mental development is sufficient to cure many cases. In adults, the habit of a tic is usually part of an obsession (q.v.) and is suitable for treatment by psychotherapy.

Tic douloureux is a spasm of the muscles of the face which must not be confused with ordinary tics, as it is due to a neuralgia of the trigeminal nerve. (*See also* NEURALGIA and TRIGEMINAL NERVE.)

TICK.—This is a small parasite, belonging to the spider class, which depends upon blood-sucking for its growth and development. Ticks lurk about the ground, in the undergrowth, and, when they obtain a host, man or animal, they fix themselves with a probe furnished with teeth or hooks to the skin and engorge themselves with blood. Both male and female draw blood, but the male undergoes little change during the operation while the female swells up to resemble a reddish purplish berry.

A considerable number of infections are carried by ticks, including the relapsing fever of Equatorial Africa, the spotted fever of the Rocky Mountains, and Texas Fever in cattle.

When a tick is fastened to the skin, do not try to pull it off roughly, but bathe it with weak ammonia solution or a little petrol. Bleeding from the wound should be encouraged, as any possible infection may be washed out in this way. Afterwards, the bite should be dabbed with iodine.

TIGHT LACING.—So far as compression at the waist is concerned, tight lacing is a thing of the past. But tight lacing itself has not gone out of fashion; its position has merely altered. Some women are unable to sit comfortably in a chair because their corsets are so tightly laced over the abdominal region that they are practically in a strait-jacket. Support for the abdominal organs, but without undue pressure, should be aimed at in these cases. The "boyish figure" is often only achieved by "tight lacing" the breasts with constricting brassieres. The effects of this new form of tight lacing may yet prove to be as injurious as the former "wasp-waisted" fashions.

TIN.—This is white metal which has a very limited use in medicinal treatment. The oxide of tin is sometimes used for the relief of boils, acne and pimples, for it has been noticed that workers with tin never suffer from such infections. Occasionally tin-poisoning may arise owing to the acids of preserved fruits dissolving off some of the metal from the can. (*See also* POISONS in FIRST AID SUPPLEMENT.)

TINCTURE.—A medicinal solution of a drug in alcohol is termed a tincture. Simple tinctures contain only one drug, examples of such being tinctures of digitalis, opium and nux vomica. Compound tinctures contain several drugs, e.g. benzoin, camphor, chloroform and gentian.

With regard to dosage, there are four very poisonous tinctures, viz. aconite, cantharidin, strophanthus and iodine mitis, the doses of which are from 2–5 minims. Others have a dosage of from 5–15 minims, while strong tincture of iodine and tincture of pyrethrum are only used externally.

TINEA.—This is the common name applied to a group of vegetable parasites or fungi which cause a number of skin diseases. The fungi produce spores, and while some varieties of tinea produce disease exclusively in man, others affect both animals and man. The tinea microsporon is the cause of scalp ringworm in children. Cats and dogs are susceptible to a variety of this tinea and this infection can be communicated to human beings.

TINNITUS, or noises in the ears, is one of those complaints which is not serious in itself, but is annoying and difficult to get rid of. It usually, but not always, accompanies deafness, and in a young woman with commencing deafness is usually looked upon as one of the symptoms of otosclerosis. Tinnitus is usually treated by giving the patient a mild sedative (such as dilute hydrobromic acid) and inflating the ears; but treatment often has to be a prolonged affair. (*See also* DEAFNESS; OTOSCLEROSIS.)

TISANES.—*Tisane* is a French word meaning an infusion or decoction. *Tisanes* of dried herbs, having refreshing and mildly tonic properties, are very widely drunk in many parts of the world. They are especially popular in France, but are not so widely known in this country as they deserve to be. It is usual to take a *tisane* instead of afternoon tea or after-dinner coffee, or else as a nightcap before retiring.

There are very many varieties of *tisane*, but here it will only be possible to mention a few of the most valuable.

Tilleul or Lime (Tilia Europæa).—The flowers of the lime tree are gathered at the end of June, dried in the shade, and stored. The *tisane* is made by pouring a pint of boiling water over a good tablespoonful of the flowers and allowing to infuse in a close-lidded pot for five minutes. It may then be flavoured either with a little lemon juice or by adding sugar, and should be drunk while still hot. It gently stimulates the kidneys, promotes perspiration, and is generally soothing. This *tisane* is widely drunk as a regular beverage. It is also taken particularly for headaches, giddinesss, over-fatigue, and hysteria.

Tilleul or Lime-tree leaves.—The leaves yield a remarkably soothing lotion when boiled for a few minutes in water. Stupes, that is pieces of linen or lint dipped in this *tisane,* allay at once the burning itch of eczema and relieve all inflamed conditions of the skin. The addition of some of this *tisane* to the bath water is said to be good for highly-strung persons and for infants in convulsions.

Camomile (Anthemis nobilis).—The flowers should be gathered before they are full-blown, carefully dried, and stored in a dry place in a closely lidded box.

The *tisane* is made by pouring two pints of boiling water over ¼ to ½ oz. of dried flowers. This infusion, like that of *tilleul,* is widely drunk as a general beverage, but it is also specially taken for sluggish digestion, constipation, windy colic and headache.

Elderberry (Sambucus nigra).—A hot *tisane* of the dried flowers is an excellent remedy for coughs and colds. Allowed to cool this makes a good lotion for the eyes.

The fresh, crushed leaves, with or without salt and vinegar, may be applied with advantage to swellings which are not inflamed, and 2½ to 3 oz. of young secondary bark boiled in a quart of water makes an excellent purgative.

Aniseed (Pimpinella anisum).—This herb acts upon the bowels and female organs. It gently stimulates the nervous system and sluggish digestion. An infusion of 1 oz. of

seeds, or 2 oz. of dried leaves, in 1¾ pints of water is recommanded for stomach-ache, flatulence, headache, giddiness, and vomiting of nervous origin.

Taken first thing in the morning by nursing mothers, it increases both the quantity and the digestibility of the milk.

Bilberry (Vaccinum myrtillus).—The berries should be gathered in Sept.-Oct. and promptly dried in the oven. As a sovereign remedy for infantile diarrhœa, boil a handful in 1½ pints of water, add some cinnamon water and a little sugar.

Maidenhair Fern (Adiantum capillus Veneris).—This plant has two special virtues —it acts upon the chest and the scalp.

An infusion of fresh or dried fronds taken daily relieves coughs, colds, and chronic bronchitis. Or a soothing syrup for such cases is made as follows:

Pour two quarts of boiling water over 4 oz. of fern leaves, cover closely, and allow to cool. When cold squeeze through a piece of fine linen and filter; add 2 tablespoonfuls of orange-blossom extract and 4½ lb. of sugar. Pour into well-stoppered bottles.

A decoction of the plant rubbed well into the scalp daily acts as a tonic, stops falling hair and removes dandruff.

Gentian (Gentiana lutea).—The only part of this plant used for *tisanes* is the root. It should be pulled in the late autumn and quickly dried in the oven. A quart of boiling water poured over ½ oz. of dried root gives an infusion which stimulates sluggish digestion, improves the appetite and acts as a general tonic.

Bittersweet or Woody Nightshade (Solanum dulcamara).—This plant possesses valuable medicinal properties. It is a stimulant, promotes perspiration, assists the kidneys and purifies the blood. It can be taken with advantage in chronic bronchitis, rheumatism, jaundice and most skin diseases. In such cases a good glass of *tisane* should be drunk on awakening in the morning. The *tisane* is made by boiling ¼ oz. of split stems in a pint of water, and the treatment should be continued for two or three months. The strength of the *tisane* may be gradually increased until ¾ oz. of the plant is used for each pint of water. Do not exceed this.

Nasturtium (Tropæolum majus).—The medical properties of this plant are found in the leaves and seeds. ¼ to ½ oz. of the fresh leaves boiled in a quart of water gives a *tisane* which stimulates the appetite and the action of the kidneys. It is also used in scorbutic and scrofulous conditions.

The powdered seeds given in a dose of 7 to 10 grains in a little honey are a good purgative and cause bowel action without griping.

Verbena (Verbena officinalis).—The *tisane* of verbena has astringent properties and is taken for mild diarrhœa. Applied externally it helps to clean up ulcers and assists healing.

The fresh leaves cooked in vinegar yield a useful lotion for calming rheumatic pains and migraine and nervous headaches.

Lilac (Syringa vulgaris).—All parts of this plant have medicinal value. A strong decoction of the bark is useful in simple infantile diarrhœa. An infusion of the leaves is effective in flatulency.

A leaf *tisane* is excellent for gout and rheumatism. It is made by pouring a pint of boiling water over ½ oz. of dried leaves and straining after infusing for 1 hour. Three glasses a day are taken: the first in the early morning, the second after the midday meal, and the third last thing at night.

Cherry (Cerasus avium).—The infusion of dried cherry flowers is used in affections of the chest, for its soothing effect upon the respiratory organs.

The decoction of leaves in milk is a mild purgative which does not cause griping.

The fruit stalks, boiled in water, afford a good diuretic, and are recommended for kidney trouble, retention of urine and congestion of the liver and spleen.

Hawthorn (Cratægus oxyacantha).—The flowers of this tree yield an infusion which may be sweetened with honey and used as a gargle for ulcerated throats.

TISSUE is a collection of the microscopic cells or elements of the body to form a distinct structure, from which the various parts and organs are built up. Some structures, such as cartilage, are formed of one tissue only with but the slightest admixture of another; other structures are simple in form, such as the blood-vessels, which are formed of fibrous tissue, elastic fibres and muscular fibres, with an inner layer of endothelial cells; while other structures are much more complex, such as the liver.

TOBACCO.—The most important constituent of the tobacco leaf is nicotine which

is present to the extent of from 2 to 5%. This is an oily alkaloid which is volatilized to some degree by heat and so is present in tobacco smoke. Numerous other substances are present in the smoke of tobacco, including hydrocyanic acid, carbon monoxide, pyridine and ammonia. It is the latter two products of combustion which are responsible for the irritating effects of tobacco smoke.

The poisonous effects of tobacco are produced chiefly through the absorption of the alkaloid nicotine. In very small quantities, nicotine is harmless, but large quantities cause sickness, vomiting, sweating and diarrhœa, and profound muscular relaxation. These are the symptoms which a novice smoker often experiences after his first experiment with tobacco. Tolerance is rapidly gained to tobacco, however, and in moderation no harmful effects arise. It is a useful and pleasurable adjunct to life if used with discretion. Many people find it is stimulating to the brain, others that it has a sedative or quietening effect. The pleasure of smoking is difficult to explain, but probably the rhythmic sucking movements have a good deal to do with it. In some people, a cigarette or pipe of tobacco appears to act as the stimulus to the normal evacuation of the bowels. Smoking by young people is definitely harmful as it affects the ductless glands and hinders development.

Immoderate use of tobacco in any form is also detrimental to health. Irritation of the throat, loss of appetite, sickness and diarrhœa may arise. The heart becomes irritable, palpitations are experienced, and breathlessness on the slightest exertion is produced. Heart pain may be produced from excessive smoking. Very serious is the effect of tobacco upon the sight. It commences with a dimness of vision and inability to read fine printing. The colour sense is often affected and unless the tobacco consumption is immediately cut down the condition may go on to blindness (Tobacco amblyopia). Both eyes are affected equally in this disease. In women, excessive tobacco smoking appears to have a specially harmful effect, tending to produce premature ageing, probably due to an early failure of the glands of internal secretion, especially the sex glands, through the action of the nicotine if in considerable amount.

Cigarette smoking is the least harmful especially if the cigarette has a filter tip or is smoked through a holder containing a removable wad of cotton-wool. Cigar smoking and pipe smoking are more liable to produce symptoms of tobacco poisoning. Should any symptom appear, it is essential that the use of tobacco should be given up until such time as complete health is restored. As the harmful substances will have accumulated in the system it will be some weeks before their ill-effects are totally removed.

TOE.—The human toes have lost a considerable amount of their freedom of movement in the course of evolution. The great toe is the most useful member, the other four being relatively unimportant from the functional point of view. Each toe consists of three segments, or phalanges, except the great toe, which has only two. In new-born babies the great toe shows much resemblance to a thumb in its grasping power and free movement.

Diseases and deformities of the toes are exceedingly common, mainly as a result of wearing ill-fitting footwear. The pointed shoe or boot is the greatest offender, especially when combined with a high heel. In consequence, the big toe is bent inwards towards the second toe and may actually be over or under it. This condition is called *hallux valgus*, and to relieve the pressure on the projecting part of the great toe a bursa or serous bag forms. This is very liable to become inflamed and is known as a bunion. Radical treatment for this condition requires the removal of part of the bone by surgical operation. Stiffness of the great toe causing immobility at the chief joint is usually associated with flatfoot. Correction of the flatfoot and the use of proper footwear is necessary in treatment, but an operation may be required in severe cases.

Hammer toe may effect any of the toes, but is most often seen in the second. In this condition there is over-extension at one joint, with marked flexion at another, with the result that the first two segments of the toe become V-shaped with the point upwards. Operation is required to relieve the deformity. Deficient blood-supply due to over-tight footwear favours the development of chilblains in the young and gangrene in the old. The poor nutrition from this cause also leads to rheumatoid changes in the

joints. (*See also* CORNS; FOOT; HALLUX VALGUS; HAMMER TOE.)

TOLERANCE.—People who take certain drugs habitually after a time are able to withstand quantities of the drug which would be dangerous or even fatal to persons not so accustomed. Familiar examples of this are provided by the habitual use of alcohol, tobacco, opium. In the case of narcotic drugs this tolerance is most marked, and very large doses may become necessary before any effect can be produced. Tolerance probably depends upon an adaptation of the tissues whereby the drugs are readily broken up and got rid of by the excretory organs.

TOLU.—This substance is generally known as Balsam of Tolu. It is fragrant, aromatic, and is used in perfumery, for the making of pastilles, and in medicine as an expectorant, i.e. to stimulate coughing. Balsam of Tolu is used in Friars' Balsam, or compound tincture of Benzoin. (*See also* BALSAM.)

TONE.—In health, the bodily organs have a vigour and reserve of vitality which is described as tone. Lack of tone is a debilitated state of the body as a result of fatigue and overwork, or following some systematic disease. In such a condition, the sufferer benefits by taking a tonic medicine, such as Easton's Syrup, which contains strychnine. This term is also applied to the condition of the muscles. Normally they are in "state of tone," i.e. there is a slight degree of tension of the muscles so that they are always prepared for action. Lowering of the muscle tone occurs in certain nerve diseases and when the general health is low. Increase of tone may be produced by excessive use of a drug such as strychnine and in some diseases of the nervous system. Tone is present in the involuntary muscles of the heart, stomach and intestines, and certain forms of dyspepsia and constipation are a result of lack of tone.

TONGUE.—The tongue is the mobile muscular organ accompanying the floor of the mouth. Its muscle fibres go in various directions and are interlaced. Covering the surface of the tongue is a moist mucous membrane. At the back of this organ there is a V-shaped series of red spots which are called the circumvallate papillæ. In front of the V there are numerous little elevations termed the filiform papillæ, and dotted here and there are larger and redder elevations called the fungiform papillæ.

The tongue is symmetrical and has a median groove stretching from the tip to the back portion and representing the position of the librous partition which divides the tongue into lateral halves. The back part of the tongue is bound down to the floor of the mouth by structures which together constitute the root of the organ. In front the tongue is free, and its under-surface has a smooth covering which is prolonged forwards to form a fold attaching the tongue to the floor of the mouth. This fold is called the frenum and, on either side of it, open the ducts of the submaxillary salivary glands. Occasionally the frenum is too short and hampers the movements of the tongue in speaking. This condition is called tongue-tie and is easily remedied by snipping the fold with a pair of scissors.

The tongue is richly supplied with blood, large branches of the external carotid artery, called the linguals, passing into the organ on both sides. All the muscles have a special nerve supply, the hypoglossal cranial nerve. The mucous membrane is supplied by fibres from the fifth and ninth cranial nerves and some fibres from the seventh cranial nerve.

The tongue has four chief functions, concerned respectively with taste, mastication, swallowing of food and with speech. In chewing, the tongue assists by moving the food to and fro in the mouth and against the hard palate. In swallowing, the tongue pushes the food mass into the pharynx and at the same time pulls up the opening of the larynx (air passage) and so allows the food to pass directly into the gullet. For speech and taste functions see under respective headings.

Tongue in Health and Disease.—Normally, the tongue should be of a pink colour and slightly moist all over. Variations in the appearance of the surface of the tongue give valuable information as to the state of the health. If the tongue is furred it is generally an indication that the digestive system is out of order either from constipation, dyspepsia, fever or some constitutional disease. The fur consists of moulds and other germs mixed with food remains and cast-off surface cells. In certain diseases there are certain constitutional changes in the tongue. In scarlet fever a strawberry tongue is observed, from resemblance of the tongue to the fruit. In

diabetes the tongue is red and beefy in appearance; in kidney disease, it is dry and cracked; in certain diseases of the nervous system, notably general paralysis, it is very tremulous.

Diseases of the Tongue.—Sometimes the tongue is affected with ulcers. These may arise from the pressure of a jagged tooth or may simply be an evidence of poor general health. Inflammation of the tongue is called glossitis. This may be caused by excessive smoking, or the drinking of too hot and pungent liquids, or from some germ infection. There is a certain amount of swelling and pain and occasionally the inflammation may go on to an abscess formation. In inflammation of the tongue, there is sometimes a danger of extreme swelling of the organ leading to complete suffocation. If such a condition should arise prompt incision of the tongue is necessary. Treatment of the glossitis requires the removal of the irritant, if any, and the use of bland antiseptic mouth washes such as borax and glycerine.

White flaky patches may form on the surface of the tongue, a condition called leukoplakia. This disease is generally associated with syphilis and excessive smoking and drinking. The white flakes may peel off and leave a cracked and fissured surface which may become cancerous. In some cases, cancer commences as a wart on the tongue which is quite painless. Later, the wart breaks down, ulcerates and the glands under the chin become involved causing pain and swelling. Operation for removal of part of the tongue and of the glands, along with radium treatment, are the only methods of cure and if these are to be successful they must be carried out in the early stages. *Therefore, it must be emphasized that any little ulcer or hard lump in the tongue should be regarded seriously and expert advice obtained as to the real nature of the trouble.*

Simple tumours may also form in the tongue, warts, fatty overgrowths, and cysts. Underneath the tongue, a small fluid swelling may collect as a result of a dilatation of a mucous gland or duct. The condition is called the ranula and it is easily remedied by an operation. Occasionally, a black patch forms at the back of the tongue. It is due to a fungus, aspergillus niger, which leads to overgrowth of the filiform papillæ. The patch should be painted with a solution of salicylic acid in glycerine, 5 grains to the ounce. *Injuries* to the tongue are often associated with considerable bleeding. This may be arrested by stitching the wound but not infrequently it is necessary to ligate (tie) the tongue artery in the neck.

Insects stings of the tongue often lead to great swelling which may obstruct the air passage. If there is any danger of suffocation, the tongue has to be freely incised.

TONIC.—Any agent which increases the tone of the body generally or of any organ or tissue is described as a tonic. It is not necessary for the tonic to be a drug; physical agents such as sunlight, fresh air, and water baths also come into the category of tonics. Tonics may be divided into different classes according to the organs they stimulate; thus, there are muscle tonics, blood, nerve, digestive and heart tonics. Iron is a most valuable blood energizer and may be given in a variety of forms, one of the most convenient being Blaud's Pills. Strychnine is a nerve tonic and can be suitably given as Easton's Syrup. Bitters, dilute acids and nux vomica are used as digestive tonics, while digitalis is the best heart tonic, for it has a specific invigorating effect upon the muscle of the heart; it increases the force of the heart beat while slowing its rate. Arsenic is a useful general tonic having a beneficial effect upon the blood and upon the nervous system. For children, syrup of iodine of iron and compound syrup of hypophosphites are excellent tonics.

TONIC SPASM.—A spasm of a muscle or group of muscles which is continuous, not intermittent, is described as tonic. Such a spasm is observed during the first stage of an epileptic fit when the whole body becomes quite rigid. This stage is followed after 20 to 30 seconds by intermittent spasms called clonic. More localized tonic spasms are seen in lockjaw (tetanus) and in strychnine poisoning. Occasionally, tonic spasms of a group of muscles may be of hysterical origin.

TONSIL.—The tonsils consist of two oval masses of lymphoid tissue—the same tissue of which lymph glands are composed—about an inch in length and half-an-inch from before backwards, placed at the back of the mouth, facing one another on opposite sides of the upper part of the throat. The tonsils are not the only lymphoid tissue structures in

this part of the body; in addition there is a smaller mass of it on the back of the tongue, called the lingual tonsil, which is sometimes enlarged, especially in adults, and also another mass up behind the uvula, between the back of the nose and the mouth called Lushka's tonsil or, when enlarged, adenoids.

This whole chain of separate masses of lymphoid tissue is called Waldeyer's ring. It is believed to have a protective function, though in reality very little is known about the function of the tonsils. It has been suggested that they produce an internal secretion, like the ductless glands of the body, but this has never been proved nor disproved. It has also been suggested that a function of the tonsils is the production of white blood corpuscles (lymphocytes), but this function, if it is of any importance in the tonsil, is in any case shared with the numerous other lymph glands of the body. It may be taken, however, that whatever other functions the tonsils may be discovered to have, their chief function is a defensive one, either acting themselves as bulwarks against infection or stimulating the body (as some authorities have suggested) to defend itself against infection, and this function is most active in childhood.

It used to be imagined that enlarged tonsils did harm only because they obstructed the airway, and the method of treating the condition was to cut off part of the enlargement, which, indeed, often did the patient some good. It is now realized, however, that a tonsil does the real harm when it is diseased (infected by bacteria), and that while many enlarged tonsils are unhealthy, a small hidden tonsil may be more septic and may cause much more harm than an enlarged tonsil. With regard to the question of whether the tonsils should be removed or not, there is to-day rather a reaction against the wholesale removal of enlarged tonsils in children. Nowadays no doctor wants to remove tonsils merely because they are enlarged; but when foul matter can be squeezed out of tonsils, and the glands of the neck are enlarged, and perhaps the child is of poor physique and suffers from various gastro-intestinal disorders—in other words, when the tonsils are no longer doing their job properly and are infecting the rest of the body—then undoubtedly the tonsils *ought* to be removed. Doctors to-day are rather disinclined to remove tonsils before the age of five, for it is up to that age that their protective function is most active, but even before that the tonsils should be removed if they are unhealthy and causing enlarged glands of the neck. It is not nowadays considered so certain as it was that unhealthy tonsils cause rheumatism in children; nor will removal of the tonsils have much effect on asthma or bronchitis; but it is doubtful if the tonsils ever fully recover from an attack of scarlet fever or diphtheria, and it is probably well to remove them when a child has fully recovered from these infectious diseases.

There is no question about the removal of adenoids; the very term adenoids means that the lymphoid tissue behind the uvula is enlarged and unhealthy, and as this affects the breathing, causes deformity of the mouth (gothic-arched palate), and frequently causes inflammation of the ears and deafness, it is evident that adenoids should be removed whenever their presence is discovered, even if the child is only a week old. Unfortunately, up to the present nothing has been discovered to take the place of surgical removal of adenoids, though breathing exercises and simple nasal drops may be useful in preventing their development.

TONSILLITIS, or inflammation of the tonsils, may be either chronic or acute.

Chronic tonsillitis means the condition of enlarged and unhealthy tonsils, to which a great variety of ailments have been attributed, some justly, some unjustly; but certainly in adults they appear to have an evil influence in rheumatism, certain types of heart disease, boils, certain types of kidney disease, persistent inflammation of the conjunctiva (white of the eye), dyspepsia, and certain types of deafness, to mention only a few that reliable authorities have catalogued. If the tonsils are not bad enough to be removed the best treatment is to paint them regularly with Mandl's paint (which is not a proprietary preparation but is called after the long-dead physician who invented the formula) which contains iodine in glycerine, flavoured with peppermint.

Acute tonsillitis is sometimes divided up into different headings—catarrhal tonsillitis, lacunar tonsillitis, and parenchymatous tonsillitis, but in reality all these are merely different stages of the same disease.

A common cause of tonsillitis is infection with the germ called the streptococcus. The tonsils are the favourite entrance of the streptococcus into the body, and it causes an acute reddening of the throat, sometimes a membrane on the tonsil resembling the membrane of diphtheria (a swab should always be taken by the doctor when the membrane is present, in case it may be the latter) and a sharp rise of temperature (up to 104° or 105° F., sometimes).

Treatment.—The patient must be kept in bed, given two aspirin tablets every four hours, and warm gargles of hydrogen peroxide or glycerine of thymol; the throat may be painted with Mandl's paint or weak tincture of iodine, but the latter is best done by the doctor, who should always be called in, as tonsillitis may mean the beginning of scarlet fever or some other serious condition.

Quinsy or tonsillar abscess, may develop after tonsillitis either inside the tonsil or in the tissues behind it. When a quinsy has definitely developed a doctor should be called in to open it, otherwise the pus in it may track down more deeply and cause severe inflammation. The tonsils should be removed after an attack of quinsy, as subsequent attacks are otherwise rather common.

TOPHUS.—Deposits of chalky material which form in certain parts of the body in chronic gout are termed tophi or chalk stones, though actually they are not composed of chalk but of sodium biurate. The commonest situation for a tophus is the edge of the external ear and other common sites are the joints of the fingers and toes. In some cases, the skin over the tophus breaks down and the chalky material is exposed. (*See also* GOUT.)

TORPOR.—This refers to a sluggish state of the mind and body. It arises frequently after a heavy meal and it is a common symptom of a disordered liver. In this latter condition, there is nearly always associated some degree of constipation and if this is remedied the liverishness disappears. The drinking of natural mineral waters is beneficial in this condition. Torpor may also occur in certain brain diseases and in brain injuries such as concussion and compression.

TORSION.—This word is used medically to signify twisting in the physical sense. Torsion of internal organs sometimes occurs, notably the intestine, a condition called volvulus. Also a tumour or growth with a stalk may twist upon itself. The term is also used to describe the stopping of bleeding during an operation, when the surgeon, by means of forceps, twists the end of a small artery which has been cut causing the inner coat to curl up and stop the flow of blood.

TORTICOLLIS.—This is another name for wry neck. (*See also* FIBROSITIS; WRY NECK.)

TOURNIQUET.—This is a French word used to denote any mechanical instrument for the arresting or prevention of bleeding. There are several different kinds, but in principle they consist of a pad which is placed



Quinsy or Tonsillar Abscess

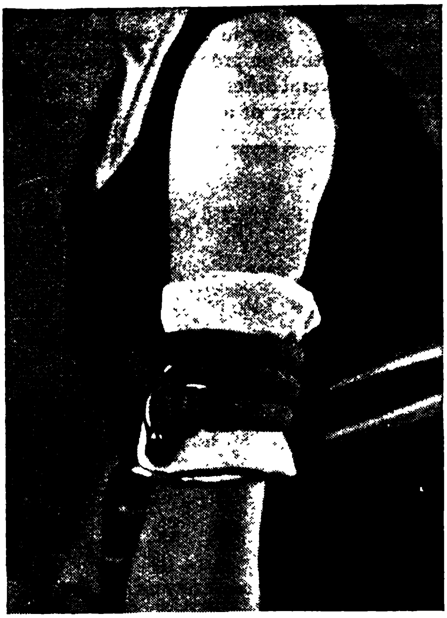
over the main artery and an appliance for keeping this pad tightly pressed over the artery in order to stop the blood flow through it. This appliance may consist of a solid rubber tube, as in the elastic tourniquet, or a metal screw as in Petit's Tourniquet.

The use of a tourniquet (except during a surgical operation) is an emergency measure. (*See also* FIRST AID SUPPLEMENT.)

TOXÆMIA.—Any condition of blood poisoning caused by the toxins or poisons produced by disease germs within the body is described as toxæmia. It is to be distinguished from septicæmia, a condition in which the germs are present and multiply in the blood. Toxæmia is also used to denote the blood poisoning caused through absorption of poisons formed by the abnormal action of the body cells. Uræmia, for example, is a condition of toxæmia caused by

the kidneys not carrying out their work efficaciously. Intestinal toxæmia is a result of constipation and depends upon the absorption of poisons from the putrefaction of food remains in the bowel.

TOXICOLOGY.—This is a section of medical science which deals with poisons, their nature and composition, their effects upon the body and the methods of their detection. Toxicology is an important branch of legal medicine. Poisons are identified by



Elastic Tourniquet

the symptoms they produce during life, by various physical and chemical tests, and, should death occur, by post-mortem examinations.

TOXIN.—This word is used to denote the poisonous substances produced by germs (bacteria) either in the body or in artificial media. Some toxins are set free from the germs and are called extra-cellular toxins; others are actual constituents of the germ substance being liberated when the germs break up and are called intra-cellular toxins. Certain extra-cellular toxins, notably those of diphtheria and tetanus, can be isolated and they can be used to artificially produce anti-toxins in an animal, the anti-toxins being the antidotes produced by the body to neutralize the effects of the toxin. Germ toxins vary in their effects upon the body and the symptoms they produce, and each toxin stimulates the body to produce the specific anti-toxin.

TRACHEA, or windpipe, is the tube, about four inches or rather more in length, which conveys the air from the lower part of the throat down to the lungs. It begins just below the Adam's apple in the neck (i.e., below the larynx), and ends in the thorax by dividing into the right and left bronchi. In section the trachea is horse-shoe shaped, and it is composed of about a score of rings of cartilage, to keep the air passage permanently open, together with elastic membrane between them. Immediately behind the trachea is the œsophagus or gullet and close to the left side of its lower end is the aorta. the largest blood-vessel in the body.

TRACHEOTOMY is an urgent operation in which the trachea or windpipe is opened from the front of the neck to allow air to get down to the lungs when the upper part of the throat is obstructed by inflammation (such as diphtheria), a foreign body, or some other cause. A tracheotomy tube, of metal or india rubber, is usually inserted, which allows of free breathing. Sometimes tracheotomy is done as a preliminary to other operations on the throat.

TRAGACANTH.—This is a gum obtained from certain leguminous trees which grow in Syria. It is a whitish exudation occurring in the form of ribbon-like transparent flakes. Tragacanth swells up in the presence of water and forms what is called a mucilage. In dispensing it is chiefly used in order to suspend powders in a mixture or for making pills. The official preparations are; glycerine of tragacanth, mucilage of tragacanth and compound powder of tragacanth, the last preparation containing gum acacia, starch and sugar as well as tragacanth.

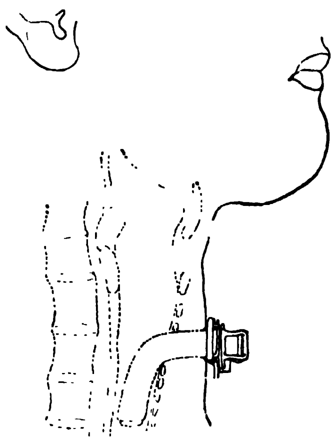
TRANCE is a deep, abnormal sleep, from which the sleeper cannot be roused or only with great difficulty and into which he or she again sinks as soon as left undisturbed. All power of movement is lost in this abnormal state, although the sleeper may be able to feel such a sensation as pins being stuck in him, and although he may know what is going on around him. The time a person may remain in a trance varies with the cause. It has been known for a person to lie in a trance for years, being fed artificially by a tube, and then one day, to "awake" and

be perfectly normal. A trance is usually the result of hysteria, but the state may also be produced by hypnotism. In hysteria, the difficulty in dealing with the patient is very great, because no help can be expected from the patient and only by the power of suggestion coupled with much persuasion can such a subject be induced to come out of the state in which she is receiving so much attention. It must be emphasized that a trance bears no relation to the state of Coma in which the patient cannot be roused, but which is due to bodily illness. (*See also* COMA; HYSTERIA.)

TRANSFUSION OF BLOOD.—If a great deal of blood is lost, as when an artery is torn in an accident, or in severe cases of anæmia, it may be necessary to replace the blood by transfusion. This operation consists of withdrawing blood from a person called the donor and transferring it to the bloodless person called the receiver. The blood may be passed directly to a vein of the receiver, but sometimes the blood is first passed into a vessel, treated with oil or sodium citrate to prevent clotting, and then allowed to run into the receiver's vein. Before the operation is carried out, it is necessary first to find out if the donor's and receiver's blood are compatible. If this is not the case, there results a destruction of the red blood cells. It has been determined that all people can be divided into four classes from the point of view of blood compatibility, each class reacting in a different way to the other three. One group can receive safely the blood of any person and it is called the universal recipient group. Another group can give blood safely to any person—the universal donor group. The other two groups have blood which is compatible with members of the same group or with that of a universal recipient.

Members of the same family need not have blood which is compatible; but, fortunately, it is comparatively simple to determine whether one person's blood can safely be given to another. In selecting a person to give blood, it is important that such a person should be free from infectious disease such as syphilis and that the person should be strong and healthy enough to afford to lose the required amount of blood. In big cities, there is generally a volunteer organization whereby a suitable donor can be obtained In an emergency, a salt solution (normal saline) is used for transfusion instead of blood.

TRAUMA.—In medicine, a wound or injury is described as a trauma and the resulting condition is termed traumatism. For example, a paralysis of the arm caused by injury to the nerve would be called a traumatic paralysis; or epilepsy due to fracture of the skull—traumatic epilepsy. Some degree of shock or depression of the body vitality occurs after trauma according to its severity and when this has abated there may be a slight rise of temperature. This is believed to be due to the absorption of the damaged tissue but sometimes it is caused by an inflammatory reaction. A traumatic



Tracheotomy Tube

neurosis is a condition of nervousness arising after a severe accident such as a railway smash. There need be no physical injury, but the symptoms are produced by the emotional shock. A traumatic neurosis persists until any claim for compensation is suitably settled.

TREMOR consists of a series of rhythmical movements of a part or parts of a limb, which movements are not under the control of the will. The rhythmical effect of the movements is due to the fact that first one group of muscles contracts, and then, in quick succession, the group of muscles which moves the part of the limb in exactly the opposite direction, so that a rhythm is set up, which is called a tremor. Tremor may be either fine, or coarse, according to the rate of the rhythm. Fine tremor is much more easily felt than seen, and can be best recognized in the arms by getting a person to hold

out his hands in front of him and separate the fingers. Fine tremor is one of the symptoms of *exophthalmic goitre* (*see also* SYMPATHETIC NERVOUS SYSTEM), of *alcoholism* and of poisoning by certain metals, especially mercury. A fin tremor also may be seen in states of agitation and in *hysteria*.

A coarse tremor is easily observed, and the most obvious condition in which it occurs is *paralysis agitans*, the disease known as the "shaking palsy." It is also a feature of the late stages of the disease "sleepy sickness" (*see also* ENCEPHALITIS LETHARGICA), when the tremor is seen at an earlier age than in the true "shaking palsy." In the very aged a coarse tremor is very common and does not necessarily mean that any disease is present. One kind of tremor which only comes on when the patient attempts to use the affected muscles is called "intention tremor." This particular tremor is seen most often in *disseminated sclerosis*, and may be recognized by asking the patient to touch the tip of the nose with the pointing finger. As the finger approaches the nose, a tremor appears, and the finger shoots past the nose on to the patient's face.

TRENCH DISEASES.—Trench warfare is liable to lead to certain peculiar disease states. **Trench fever**, very common during the Great War in front line troops, was an infection caused by a minute organism distributed by lice. There is an incubation period of about a week to nine days and then the patient is taken suddenly ill with shivering, aching limbs, headache, giddiness, and occasionally sickness, vomiting and diarrhœa. The severe pain in the shin bones is very characteristic of the condition. There is a continued fever for about 10 to 14 days and then it gradually subsides; but there are often relapses. Although the disease is never fatal, it often leaves behind a severe general debility and irritability of the heart. There is no special treatment, and symptoms must be treated as they arise.

Trench Feet were frequently observed in the early part of the Great War. The affection was due to exposure to cold water and mud, with the result that the feet became sodden and sometimes infected with septic germs. The constriction of the legs, produced by puttees, is also believed to have helped to cause the condition. In severe cases gangrene of the feet resulted, and sometimes blood poisoning arose. The wearing of high gum boots and frequent changes of dry socks greatly diminished the frequency of this affection. The rubbing of oil into the feet also helped to prevent its incidence.

Trench Nephritis was the term applied to the kidney inflammation which occurred frequently amongst troops in the field. Actually, this disease was no different from the nephritis in ordinary conditions of life, but its greater frequency amongst soldiers was due to the strain, exposure, fatigue, and infections to which they were liable. As a rule the condition cleared up fairly rapidly under hospital treatment and recovery was generally complete.

TREPHINE.—The operation of boring a circular opening in the skull is performed by means of a special cylindrical saw called a trephine. The trephine removes a small circle of bone from the skull and so exposes the dura mater, the tough outer membrane of the brain. The operation is carried out in cases of depressed fracture of the skull and when one of the arteries, particularly the middle meningeal, is torn and bleeding. It may also be performed to relieve pressure within the skull in cases of cerebral tumour or for the draining of abscesses. Frequently, several trephine holes are made and the intervening bone removed in the form of a flap by a wire saw.

TREPONEMA PALLIDUM.—This is the organism or germ which causes syphilis. It is a long slender organism containing six to fourteen spirals and it is actively mobile, moving in a corkscrew fashion. The treponema is found in the diseased tissues of the primary and secondary stages of syphilis, and it occurs in the brain in general paralysis of the insane. It is also known as the spirochæta pallida. (*See also* SYPHILIS.)

TRICHIASIS.—Inversion of the eyelashes is termed trichiasis. Normally, the eyelashes protrude outwards from the eyelids, but, as a result of inflammation of the lid margins, one or more of the eyelashes may be directed inwards so that they rub against and irritate the delicate surface of the eye. This may in time give rise to ulceration of the cornea with impairment of the vision. Treatment is simply the pulling out of the offending eyelash and the complete destruction of the root by electrolysis. (*See also* EYELIDS.)

TRICHINOSIS.—This is a disease caused by eating pork infected with a tiny round worm called the trichina spiralis. The parasites invade the voluntary muscles setting up inflammation. The worms become encysted between the muscle fibres remaining alive for years. No satisfactory cure is known. (*See also* WORMS.)

TRICUSPID VALVE.—This is one of the heart valves. It is situated between the right auricle and the right ventricle, and is provided with three cusps. Unlike the mitral valve, it is not frequently the seat of disease. (*See also* HEART.)

TRIGEMINAL NERVE is the nerve which controls the muscles of chewing, and it also enables us to feel such sensations as pain, heat and cold, and touch, on our face and in our eyes, nose, mouth and teeth. It is the "nerve of toothache." Our sense of taste is also, to some extent, governed by the trigeminal nerve and any damage to the nerve in a particular part of its course in the skull will cause the sense of taste to be diminished or abolished on the front two-thirds of the same side of the tongue. The trigeminal nerve is connected with nearly every other nerve supplying the head and neck, and because it has all these connections it has situated on it, outside that part of the brain from which it arises, a mass of grey nervous tissue called a ganglion. This ganglion, the Gasserian ganglion, separates out, as it were, the different parts of the nerve that are going to supply different areas of the face, and these separate parts, or branches of the nerves leave the skull through separate holes.

In neuralgia of the trigeminal nerve, called *Tic douloureux* (*see also* NEURALGIA and TIC), it is possible to obtain relief for the sufferer by injecting alcohol into whichever branch of the nerve is affected by the neuralgia, as commonly only one branch is so affected. But if the effect of the alcohol injection does not last, or the neuralgia spreads to the area supplied by another branch of the nerve, then it is possible to deal with it by either injecting alcohol into the Gasserian ganglion itself, inside the skull, or in very bad cases, by cutting the ganglion. This operation is not lightly undertaken, as it is a serious one. Fortunately it is rarely required as an alcohol injection into the ganglion benefits all but the very worst cases of trigeminal neuralgia.

TRIONAL.—This is an hypnotic or sleep-producing drug. It is a colourless, odourless, crystalline preparation with a slightly bitter taste. It is taken as a rule in hot milk in 10 to 20 grain doses. Trional usually produces sleep in from one-half hour to an hour. Some slight depression and lack of energy are experienced the day following administration. Its prolonged used may lead to drug habit. Symptoms of poisoning are similar to those of sulphonal. (*See also* SULPHONAL.)

TRISMUS.—This term refers to a tonic spasm of the muscles which clench the jaws. The sufferer is unable to separate the teeth and feeding becomes difficult. Trismus is a symptom of lockjaw (tetanus) and it may occur in meningitis. Occasionally, it occurs as an hysterical symptom.

TROCAR.—A metal instrument for tapping collections of fluid in different parts of the body is termed a trocar. It consists of a sharp pointed perforator which fits accurately into a tube or cannula, only the sharp point projecting beyond the end of the cannula. After the trocar and cannula are plunged into the part of the body to be tapped, the trocar is withdrawn and the fluid allowed to run out into a receptacle. The trocar and cannula are used to tap pleural effusions in wet pleurisy, urine from an obstructed bladder, fluid from a hydrocele. (*See also* SOUTHEY'S TUBE.)

TROCHANTER.—The trochanters are the projections situated on the upper part of the femur or thigh bone. They serve for the attachments of muscles. (*See also* FEMUR.)

TROCHLEAR NERVE.—This is the fourth of the cranial nerves. It emerges from the skull through the orbit and supplies the superior oblique muscle of the eye, the function of which is to pull the eyeball downwards and outwards. (*See also* EYE.)

TROPHIC.—The nervous system through the individual nerves has an important influence on the nutrition of the tissues. This is termed the trophic function of the nerves. If a nerve is injured or severed, the muscles, skin and tissues generally tend gradually to become wasted. The skin becomes smooth, thin and glossy, and readily becomes inflamed, the nails and hair are also affected. Trophic sores occur in organic diseases of the nervous system, e.g. in locomotor ataxia,

Ulcers form and the tissues gradually decay. Such sores show little or no tendency to heal.

TROPICAL LIFE AND HYGIENE.—The London School of Hygiene and Tropical Medicine carries out researches into tropical conditions as they affect health. Research into these matters had already been going on for some years, and the beginnings are interesting to Londoners, for it was down in the Dock region that the Seamen's Hospital Society started its work of caring for foreign sailors who came in on ships sometimes suffering from strange illnesses hitherto unknown in this country. That Society began its work on the old fifty-ton *Grampus* lying in the Thames. The Society began investigations into such diseases as malaria, beri-beri, plague, sleeping sickness, leprosy and guinea-worm; and gradually students and others who were intending to go to the tropics came to learn what the conditions were out there, and the kind of risks that would have to be taken by Europeans.

The Hospital for Tropical Diseases, Endsleigh Gardens, London, is an establishment of the Seamen's Hospital Society, Greenwich, for seamen of all nations.

Officers of the regular Royal Army Medical Corps, who have to serve wherever they are required, receive instruction in tropical diseases on joining and before promotion to major.

TRUSS.—An instrument or appliance for the control of a hernia or rupture is called a truss. In principle, it consists of a firm pad to which is attached a strong steel spring which encircles the body. The pad is shaped according to the type of hernia it is designed to control, and the angle of fixture to the spring varies similarly. The spring is lined with wash-leather internally and prepared leather externally. For an inguinal hernia the pad is triangular and lies in a line with the spring belt. Sometimes the pad is continued down into the crutch or perineum and is attached to the back of the belt—the so-called rat-tail truss. The pad for a femoral hernia is more rounded and is fixed at a sharper angle to the belt. In the case of an umbilical hernia, the pad is circular and varies in size to suit the size of the opening.

Great care is required in the fitting of a truss, for if it is badly fitting it not only fails to perform its function but also leads to discomfort or pain. A truss is generally worn only by day and is removed when lying down in bed. It should be again fitted first thing in the morning in the recumbent posture.

In children, an all rubber truss with an inflatible bag has advantages over the spring and pad. type of truss. It can obviously be kept clean and it is not likely to lead to discomfort when worn. For the umbilical hernias of children, a truss can be improvised by covering a penny with cotton wool and sewing it between two layers of plain lint. It is very seldom that a truss really cures a hernia, except in the case of the umbilical hernias of young children; they control the defect and prevent it getting worse. In a young healthy adult, an operation is to be preferred for the repair of the abdominal wall. The wearing of a truss is a great handicap to an active life. (*See also* ABDOMINAL BELT; HERNIA.)

TRYPANOSOMA.—This is a variety of micro-organism belonging to the protozoa group and occurring as a parasite in man and the lower animals. A trypanosoma is a worm-like structure with a large nucleus centrally situated and a whip-like process or flagellum attached at the hinder end. It is by means of the activities of the flagellum that the parasite moves; its multiplication may be by simple division, or in the body of the tsetse fly it undergoes a sexual reproduction. There are a number of trypanosomas, some harmless, but one is responsible for the tropical disease called sleeping sickness. This is a blood infection and the disease is transmitted from one person to another through an intermediate host, the tsetse fly. The disease is endemic in Central Africa and South America. It is sometimes referred to as Trypanosomiasis. A variety of trypanosoma causes the disease called surra which affects horses, dogs, camels and elephants. (*See also* SLEEPING SICKNESS.)

TRYPSIN.—This is the protein-splitting ferment which is found in the pancreatic digestive juice which is passed into the small intestine. It requires an alkaline medium to carry out its work, and it completes the digestion of proteins which have been partially digested in the stomach by the ferment pepsin. Trypsin is a much more powerful ferment than pepsins and reduces the protein of the food to its simplest elements (amino-acids) and so enables their

absorption into the blood stream to take place. Actually, trypsin is in an inactive form called trypsinogen when secreted, and it only becomes active in the small intestine as the result of another ferment from the intestinal juice called enterokinase. Preparations of trypsin made from the pancreas of animals are used in the making of pre-digested foods. (*See also* DIGESTION; PANCREAS.)

TSETSE FLY.—This fly belongs to a species known as glossina of which there are several varieties. It is a dark-coloured narrow-bodied insect about 6 millimetres long, with brown-coloured wings which have well marked veins. The fly is found in tropical Africa and South-West Arabia, and it inhabits thick scrub or bush near water.

The glossina is a blood-sucking insect, both male and female biting and being capable of transmitting the trypanosoma which causes sleeping sickness in man. The fly is the intermediate host of the trypanosoma which undergoes its sexual development in the body of the fly.

TUBAL PREGNANCY.—A fertilized ovum arrested in the Fallopian tube on its downward course to the womb gives rise to tubal gestation or pregnancy. As this is an abnormal place for the development of the embryo, the tube usually ruptures between the sixth and twelfth week of pregnancy, a dangerous happening—for it is associated with great shock and severe internal bleeding. An immediate operation is generally necessary.

TUBERCULIN is an emulsion of dead tuberculosis germs and is used in weak dilutions in the treatment of tuberculosis. The great success once hoped for by employing tuberculin has not been realized, but it is still valuable when combined with other methods of treatment. It is also of undoubted value as a method of diagnosis of tuberculosis. (*See also* TUBERCULOSIS.)

TUBERCULOSIS.—Pulmonary tuberculosis, or **consumption,** is the term applied to tuberculosis affecting the lungs. It starts off by the formation of "tubercles," small abnormal masses of tissue due to the presence of a germ called *Koch's bacillus.* Koch was a famous German bacteriologist (1843–1910) who first described the germ which is the cause of tuberculosis. It is contagious from one person to another, from animals to man, and from man to animals. There are three main varieties of the tubercle bacillus: the human, the bovine and the avian. Infection from human sources is probably much more frequent than from any other; but quite a large amount of human tuberculosis is caused by germs of the bovine type, and tuberculosis may be communicated to man from infected cow's milk, and from tuberculous meat, either beef or pork.

Avian tuberculosis is of considerable practical importance because it attacks poultry and many other birds in captivity.

Most domestic animals are liable to tuberculosis. It is most common in the ox, pig and horse, much less so in the sheep and goat, cat and dog. It is frequent in the fowl, pigeon, parrot, peacock and other domesticated birds. Wild animals, both mammals and birds, in their native state, never suffer from tuberculosis, but when kept in captivity are prone to be attacked, and a large number of the deaths in the Zoological Gardens, particularly among the apes, are due to this disease.

The germ can invade any part of the human body, but it usually becomes localized in the lung passages. It may be confined to the lungs alone, to the bronchial tubes only, or to both bronchial tubes and the lungs, and may manifest itself in an acute form (galloping consumption) a less acute form (subacute), or in a chronic form (fibroid tuberculosis).

It is quite possible to have tuberculosis of the lungs without knowing it, though it may be present and active, unsuspected by the patient or his doctor, at the time of death from some other cause, and further, it may have been active and have healed up completely without any definite treatment and have given no signs of its presence during life. Once recognised, however, tuberculosis of the lungs is so far advanced that it rarely heals up completely, though it can very often be arrested and life is not shortened although some evidence of the past activity of the disease remains.

Diagnosis.—It is most important that this should be early in order that the treatment may be successful. Unfortunately the onset of tuberculosis is very insidious, and the disease may be very extensively spread in the lungs without causing sufficient ill-health to make a person consider himself sufficiently

ill to consult a doctor. The following symptoms are suggestive of consumption:

Symptoms.—Cough and Sputum. In most cases cough with *sputum* is the earliest indication, and in a young adult persistent cough, especially when accompanied by *purulent sputum* (phlegm containing a great deal of matter) is very suspicious unless there is some obvious cause for it such as an unhealthy state of the nose and throat due to over smoking, etc. In older people chronic bronchitis is very common, and unless a marked change appears in the type of cough and the sputum, little importance can be placed on their presence. The cough of early tuberculosis of the lungs is not distinctive, but may vary from the dry cough such as accompanies a throat irritation to the satisfying free cough that is accompanied by a copious supply of phlegm. This phlegm is not distinctive; it may assume any form. It is not necessarily full of matter, and in some cases there is no phlegm at all.

Hæmoptysis or bleeding from the lungs. This is the first sign in roughly 18 to 20 per cent of cases. It varies from streaks of bright colour in the sputum, definitely blood-stained phlegm, to the *coughing up* of practically pure blood (hæmoptysis). If the bleeding is copious the blood is from an artery, and is sometimes frothy owing to the presence of air bubbles in it. It is practically always followed by blood-stained phlegm and clots for a day or so, and this blood is dark and comes from the veins. The appearance of blood in the phlegm is almost as definite a sign of tuberculosis of the lungs as the finding of the casual germ in the phlegm.

There are other causes of blood coming from the lungs. Blood from the stomach is distinguished by the fact that it is dark in colour, is acid, and is vomited up instead of being coughed up, it is not frothy, and there is usually a history of some previous stomach trouble. Blood from the nose or back of the throat can be distinguished by an accurate examination. In some cases of pneumonia blood-stained phlegm is common, and in those cases where the question of tuberculosis arises the phlegm is not of much value. Bleeding from the lungs, however, in a young adult, with or without symptoms of ill-health in phlegm which persists may be taken as practically certain to mean consumption. It is important to remember that a brisk hæmorrhage is often absolutely the first symptom, and that there may be as much as one pint of blood lost without previous cough or presence of phlegm, and without a careful physical examination of the chest revealing any abnormalities in the lungs.

Pain.—Tuberculosis of the lungs in an early stage is usually painless, but in practically every case, however, there is sooner or later an attack of pleurisy (inflammation of the lining membranes of the lung and inner surface of the chest wall) which does cause definite pain. In about 5 per cent of all cases the pleurisy is the first symptom. The history of a cold or of an influenzal attack followed by pain characteristic of inflammation of the lining membranes of the lungs should always be regarded as a most suspicious circumstance.

Difficulty in breathing; Dyspnœa.—In cases where much of the lung has been attacked without symptoms, accompanied or followed by extensive healing and the formation of scar tissue, it may cause difficulty in breathing, or cause the patient to seek advice for this alone. In some cases fluid will fill up the space between the lung and the chest wall without causing any pain, though it may cause much difficulty in breathing.

Influences on the general health.—This is often very slight, and is often ignored or disregarded by both the patient and the physician. The symptoms are common to many illnesses, and may only be of use as corroborative evidence. The most important are: *Malaise:* an indefinite feeling of tiredness lasting for months. Sometimes it appears only as undue tiredness at the end of the day's work. It may show itself as a general disinclination to work or play, or as a definite feeling of exhaustion whether the patient is up and about or lying in bed. It is usually partly physical and partly mental. *Weight Loss:* If a young adult loses weight in a rapid and marked fashion it is very important. *Night-Sweating:* This is common at the beginning and usually disappears as the case settles down. The point here is that the sweats occur although the patient is not conscious of having had any fever. The perspiration may be so copious as to necessitate many changes of night attire. *Fever:* Often the temperature is raised without the patient being aware of anything unusual.

The high temperature is very suggestive, though it is often missed as it is unusual for one to take one's temperature when in apparently normal health. *Anæmia:* This may be severe owing to the general poisoning of the system owing to the germ of tuberculosis. The heart muscle is weakened, and this will cause palpitation and difficulty in breathing. In women the anæmia may be sufficient to cause suppression of the periods for a time. *Digestive disturbances:* These are commonly complained of during a period of about two years before the first signs suggesting consumption appear. These disturbances are so common that they are not very important. *Ischio-rectal abscess and Fistula:* An abscess in the region of the anus is a common complication. Every case of this condition should be carefully examined, as it may be the means by which the presence of consumption is detected.

The most important factor in the medical examination of the patient is the examination of the phlegm (sputum) for the presence of the germ of tuberculosis. There are very few cases without phlegm, and in those cases where it is absent, but consumption is suspected, a medicine containing potassium iodide for a few days will usually produce some. For examination the phlegm should be collected in the morning, and it must be coughed up, and not hawked from the back of the nose. The necessary tests are readily performed by any pathologist. A negative result only shows that there were no germs in the particular specimen examined, and does not mean that the patient has not got any. At least three separate examinations should be done, and even then the absence of the germ must not be taken as definite evidence of the absence of disease if other items of evidence are strongly in favour of tuberculosis of the lungs being present. The presence of the germs of tuberculosis in the phlegm, of course, makes the diagnosis of tuberculosis of the lung certain.

Question of Temperature.—The temperature of a normal individual is 98·4° F., with possible variations of from below normal in the morning to just above in the afternoon about six o'clock. A daily swing of more than one and a half degrees is definitely abnormal. For the purposes of testing for tuberculosis the temperature should be taken night and morning (5 p.m. and 8 a.m. are good average times.) The thermometer should be put properly in the mouth, the patient must sit still, and should not have had anything to drink or eat or even have been out in the open air for at least a quarter of an hour beforehand. The thermometer must be kept in the mouth for full five minutes by the clock. Note should be taken regarding the amount of exercise made during the day, as the temperature is very susceptible to the amount of exercise, both mental and physical, in cases of tuberculosis of the lungs.

Blood Examination.—This shows the same characteristics as in an ordinary secondary anæmia.

Physical Examination.—There may be nothing abnormal in the appearance of an early case, but disease of any extent will be accompanied by diminished movement of the chest wall on breathing over the affected part.

X-ray Examination.—This is a very useful aid to diagnosis, but some degree of skill is required to interpret the picture. The X-ray picture must always be regarded as definitely subsidiary to the other points mentioned above, and the diagnosis as a whole depends entirely on the collection and weighing up of various items of evidence for and against.

Types of Acute Tuberculosis of the Lungs. —*Miliary:* So-called because there are numerous lesions the size of a millet-seed. This only occurs in the lungs when it is part of a general infection all over the body.

Broncho-pneumonic Tuberculosis. ("Galloping Consumption"): This is a rapidly progressive condition and is usually fatal within six months. The lining membrane of the smaller bronchial tubes are infected most and there is a great deal of destruction of tissue. *Pneumonic:* This is not very common. Large areas of lung become solid and the patient usually dies within a few months; but some cases manage to survive the acute stage and become chronic. Large areas of tissues are destroyed and *cavities* are thus produced.

Types of Chronic Tuberculosis of the Lung. These are more common than the acute types. The route by which the germ reaches the lung is not definitely known, but it is most probably by the germs being breathed in when they are present in the air in dust, etc. In some cases the germs may be

swallowed in food, as in the case of infected milk, and may travel by means of the blood or lymph streams to the lungs. Once there the germ produces a small *tubercle* or lump which gradually grows bigger. The centre portion is cut off from its blood supply and breaks down, a process known as *caseation.* The natural defence of the body is to grow fibrous tissue round the outside of the tubercle. Sometimes this is successful, and the result is a small fibrous nodule only. Lime salts are often laid down in the centre portion of the tubercle, a process known as *calcification.* If nature's attempt at healing is not successful the area of disease increases and the original tubercle joins up with others which have formed near it. The enlargement is very irregular, and the disease may be advancing in one direction while healing by fibrosis is occurring in another. Finally, one of the walls of the smaller bronchial tubes becomes ulcerated through, and the broken-down portion inside is emptied into the air passages which, in their turn, are so irritated that they try to get rid of this dead matter by coughing. In this way the germ of tuberulosis will appear in the phlegm.

Classification.—Many attempts at classifying the various stages of the disease have been attempted, but all have various defects. The classification adopted by the London County Council for all cases under their control, works well in practice and is as follows: *Class A:* Cases in which the tuberculosis germ has never been found in the phlegm. *Class B:* Cases in which the germ has at any time been found. A patient in Class A must be transferred to Class B at any stage in the course of treatment if and when the germ is found; on the other hand, a patient once in Class B can never be referred to Class A. Class B is further subdivided into three groups: *Group I:* Cases in which the general health is but little affected, e.g. there is very little elevation of temperature, little wasting, etc. *Group II:* All cases which cannot be placed in Group I or III. *Group III:* Cases with marked changes and some constitutional deterioration. Very little prospect of permahent improvement.

Treatment.—In regard to the treatment it is necessary to estimate the patient's temperament and character. It has been truly said that one cannot cure a fool of tuberculosis.

The treatment is long and troublesome and may have to be carried on throughout life. Endless steadfastness, courage, self-discipline and self-denial are required, and the final result depends more on the presence or absence of these qualities than on anything else. But courage is often misapplied, and has to be guided into the right channels. The patient finds it hard to face the real truth and the real hardships of the road to recovery. Financial and home conditions are also of importance, as the treatment may last for five years or more and must be adapted to suit the environment.

Surgeon-General Bushnell's (U.S.A.Army) famous remark lies at the base of all treatment: "For tuberculosis we prescribe not medicine, but a mode of life." No certain cure for all cases of tuberculosis is known, but it is certain that in a large proportion of cases the disease is made worse by a faulty mode of life, and that if we alter the mode of life we shall be giving the correct treatment in some measure. It is very important that there should be continuous treatment, and that the patient should place himself in the hands of one doctor who is entirely responsible all the time; there are several lines of treatment that will be successful in a particular case, but often a hopeful case turns out a failure owing to lack of continuity of treatment. This is more liable to happen to patients who go from one doctor to another getting excellent advice which is changed with each visit until the disease is so far advanced that all chance of a good result is passed.

Some patients do not come to be treated until the chance of cure is passed; but it must be realized that treatment, if successful, will result in the patient being able to lead a happy and useful life, though it is likely to change for the worse should a proper mode of life not be persisted in. The chief aim and object of *sanatorium treatment* is to teach the sufferer this mode of life, and is not expected to cure the patient completely. The treatment can, of course, be carried out at home, but there are many arguments in favour of institutional *versus* home treatment. The groundwork of all treatment is a monotonous disciplined daily routine, so much so that it is very difficult for the patient to carry it out alone. The treatment will completely upset the usual routine of a home, and it is

not uncommon to find that the rest of the family cannot put up with it.

Another important point is that the condition of the patient may alter from day to day, and that such alterations should be met by slight deviation of treatment; these details are very important in the long run, and mean that daily supervision is necessary. The family doctor can rarely afford to devote so much time to one patient, nor in many cases can the patient afford the expense.

Choice of Sanatorium.—The conduct of the treatment and the sanatorium staff are far more important than the altitude and climatic conditions. In some sanatoria abroad the *climatic* conditions are far superior to anything we have in Great Britain, and in a few cases the extra expense may be worth while, but in nearly all cases as good a result can be obtained at less expense in an English sanatorium. The time spent should be not less than six months to one year.

Sanatorium Treatment.—The object of this is intended to refit the consumptive for the ordinary conditions of life. Its three main objects are:—1 To regain health and resistance to disease; 2 To maintain this gain; 3 To teach the individual the best way to live the remainder of his life.

The case must be suitable for sanatorium treatment and not advanced too far. The mental outlook is very important; the patient should clear up all domestic and financial worries as far as possible before the treatment is begun. No good result can be obtained in the case of a man worrying over the welfare of his family or his business, or in the case of a woman who is anxious about her children. The patient must be taught that his main object is to become as well as he can, and not to worry how soon he can return to work or to his home.

The essentials of treatment are:—Rest, both of mind and of body; graduated exercises; fresh air and sunlight; routine and discipline; correct feeding. All these are graduated and controlled daily by skilled medical supervision. The best method of controlling the general symptoms, such as fever, shortness of breath, etc., is by rest, and the "rest" in a sanatorium means from 10 to 12 hours in bed every night, with two or three "rest" hours during the day. Complete confinement to bed is insisted on where the temperature varies too far from the normal, where there is true night sweating, or where there is a regular loss of weight. The patient is not even allowed to get out of bed for the calls of Nature, and has to use the bed-pan. Blanket-bathing is also necessary. Visitors and outside excitements are prohibited. After a few months, and when these general symptoms have disappeared, graduated exercises are begun. These are of value in three ways: they restore the tone and efficiency of the whole of the muscular system, especially of the heart muscle; they accustom the body to increasing doses of fatigue and to the poisons produced by the germ of tuberculosis; and they also restore the mental and moral tone and help to maintain that cheerful attitude of mind which is so necessary to successful treatment. The exercises start with ordinary actions such as washing, eating, talking and writing. After this, walking exercises, carefully graduated, will take many months. Much damage can be done by too much exercise, though little harm is done by taking too little. The symptoms to be watched for are undue fatigue, shortness of breath, and pain. Graduated manual labour—to prevent the loss of moral tone which is so liable to occur when walking is the only form of exercise allowed—has been a fairly successful experiment. Gardening is the most convenient form of manual labour.

Fresh Air and Sunlight.—As many hours as possible should be spent in the open air, and when indoors the windows must be widely opened, or taken out of their sashes.

Routine and discipline, and education.—The essentials of sanatorium treatment must be followed for the rest of the patient's life, and this must become automatic, as otherwise the worry of attention to detail would be a burden both to the patient and to those around him. The strict routine of a sanatorium produces this atmosphere and, like other forms of physical training, takes some months to do its work, and then only if persisted in day by day for several months, without relaxation.

Food.—Special diet is not necessary: three good meals a day should be taken and the food thoroughly masticated and digested. Teeth must be put right so that the food can be properly chewed. The normal weight in health for each individual patient should be the aim to which he must strive to return.

Drug Treatment.—These may be reserved till they are really needed, as the treatment is in most cases a long one. Sometimes a tonic at a suitable moment may improve a patient whose progress is stationary. Cod-liver oil is one of the best-known remedies and is of great value.

Tuberculin.—This is a preparation made by an emulsion of the dead tuberculosis germs. The emulsion is diluted into suitable strengths and is given by injection. In some cases which will not improve on the ordinary routine measures it may be a useful addition. It must be remembered that sometimes a severe reaction may be obtained which produces an exacerbation of the disease.

Treatment of the Lung Condition.—This is also treated by rest. Lately, methods have been found whereby the lung itself can be put to rest completely for a lengthy period of time. In the case of tuberculosis in other parts of the body, such as the knee, there is no difficulty whatever in putting it entirely to rest; but in the case of the lung complete rest means that the lung cannot do any breathing. It has been found that it is possible to live with only one lung working; so that if one lung is fairly healthy, it is possible to give the tuberculous one a complete rest. The diseased lung is given a rest by allowing air, or a gas such as oxygen, to enter the space between the lungs and the chest wall. Normally both the lungs and the inner side of the chest wall are lined by a closed bag known as the pleura. One wall of this bag is firmly attached to the lung and the other is attached to the chest wall. The sac contains only sufficient fluid to enable the walls of the lung to glide over the walls of the chest without causing friction, and the lungs are kept in contact with the chest wall by the fact that there is no air at all within the sac, e.g. there is a suction effect, and there is the ordinary atmospheric pressure of 15 lb. per square inch in the inside of the lungs forcing it into contact with the bony chest wall. The tissue of the lung is elastic, and when air is allowed to enter the closed sac the air pressure on both sides of the lungs is the same, so that there is nothing to prevent the elastic tissue from contracting and so pulling the lung away from the chest wall. The lung accordingly collapses. This condition is known as an *artificial pneumothorax.* Where only a little air is allowed into the pleural cavity, the degree of lung collapse is slight and the air space is shallow.

In most cases the air in the sac is gradually absorbed, and has to be replaced when necessary; so that if this treatment is found to be unsuitable it can be discontinued.

In some cases the response to the artificial collapsing of the lung is dramatic: the fever disappears, the cough and phlegm cease, and there is a marked improvement in the patient's general condition.

The lung is kept in a contracted state for as long as possible, preferably for from two to three years.

Treatment of Symptoms.—The general feeling of ill-health usually disappears very soon after the rest in bed has been started. The only medicine necessary may be a tonic to stimulate the appetite.

The cough also tends to disappear during the course of ordinary routine treatment. In some cases it persists, and may be due to irritation from the throat, to the presence of tenacious phlegm, or because of the presence of much phlegm containing pus. The irritation from the throat is liable to worry the patient, and the more it worries him the more liable it is to occur. It comes on in paroxysms and may prevent proper sleep at night. A little creosote and cinnamon oil inhaled will often relieve it. Smoking, etc., must be stopped. The cough due to the tenacious phlegm is treated by drugs which tend to loosen it; potassium iodide, ammonium chloride, etc. On the other hand the cough due to much phlegm containing pus is a useful one as it gets rid of this waste matter. It should be aided by simple expectorant mixtures. The mucous membrane of the lung passages should be cleaned up as far as possible by the inhalation of creosote or other disinfectant oil, and the lung should be drained at definite periods during the day by making the patient take the attitude necessary for the matter in the chest to flow out under the influence of gravity.

Pleurisy is evidence that there is active disease in the lung. The pain is best treated by tightly strapping the part of the chest where the pain is felt. Sedative mixtures may be necessary.

The difficulty in breathing due to the poor condition of the heart or to the general anæmia will improve during the rest, which is part of the routine treatment necessary.

Bleeding from the lungs (hæmoptysis) is treated by putting the patient to bed at once. Morphia, in doses of a quarter of a grain, injected under the skin helps greatly to calm a terrified patient. It also lessens the risk of the blood being sucked into healthy parts of the lung.

When the bleeding stops the patient should be made to rest in bed for some days. Heavy doses of bromide should be given to help him to sleep. Food should be readily digestible and in moderate quantities given at regular intervals.

Methods of Spread of Tuberculosis.—The germs of tuberculosis are present in the phlegm which is coughed up. These germs can exist for as long as six months, though they cannot exist long in bright sunlight. During ordinary conversation the saliva is thrown out in the form of a very fine spray, and a cough will throw it for a distance of several feet. Experiments have been carried out by rinsing the mouth with a solution containing an easily recognisable germ, and it was found that, after quiet talking, plates of culture media would grow this germ up to 20 feet away from the talker. If the voice was raised, as during a public speech, plates up to 40 feet away were infected. Dust containing the germs of tuberculosis is liable at any time to be inhaled and so infect the person breathing them in. The habit of wetting the finger with saliva to turn over the pages of a book is a fairly frequent mode of transmission; the same applies to collecting stamps, the playing of musical instruments belonging to other people, and even to the eating of fruit, etc., exposed to a dusty atmosphere. The discharges from an area of active tuberculous disease, as from a tuberculous joint, bone, ear, etc., are less infectious than the phlegm coughed up by a person suffering from consumption.

Tuberculous meat is not a common cause of infection, as cooking usually sterilizes it readily. The interior of a fairly big joint may not be heated sufficiently to be safe in this respect, but fortunately the actual muscles seem to be very rarely affected, tuberculous meat being a term usually applied to joints where the areas of disease are confined to the fatty tissues between the muscles. Milk, however, is a very dangerous source of infection; not only when it comes from cows with tuberculous mammary glands, but also in cows found to be suffering from tuberculosis of any kind. In large towns the milk is usually *pasteurized*, that is to say it has been heated to a temperature between 60° and 70° C. (boiling being 100° C.) for a short time. This process kills most of the germs in the milk. It does not, unfortunately, always kill all the germs of tuberculosis, and again the fact that it destroys the lactic acid bacilli—the germs which make milk go sour—tends to encourage the sale of milk which is not very fresh. The process of pasteurization also seems to destroy properties in the milk which make it invaluable for growing children. Fresh milk has also been shown to be of great importance in the proper growth of the permanent teeth.

Milk should be obtained free from the germs of tuberculosis by ensuring that the cows producing it are free from the disease, and it should not be necessary to sterilize it later to render it free from harmful bacteria.

Preventive Hygiene.—One should always be in the habit of breathing deeply and always through the nose. The natural secretions of the nose have an action which prevents the growth of the tuberculosis germ. It is as well not to wear scarves, as this renders the neck liable to infection. Fresh air and sunlight should be made use of as much as possible; the windows should be kept open both during the day and by night. Rooms should be kept clean and dust removed either by a damp cloth or by the more modern vacuum cleaner. A consumptive should carry a special receptacle in which to spit after coughing. These receptacles are made of various shapes, but all should contain some disinfectant fluid such as carbolic acid or a weak solution of a mercury salt. In his own interest he should never swallow his phlegm, because he can thus infect his own intestines. He should cough as little as possible, because a dry cough that does not bring up any phlegm is very fatiguing.

A purposeful cough forcibly expels a lot of saliva, etc., and this should be prevented from spreading by holding a handkerchief in front of the mouth. Handkerchiefs made of paper are best as they can be burnt after use; ordinary ones made of linen must be boiled before being mixed with the rest of the laundry. The consumptive should sleep by himself. The room must only contain necessary articles of furniture, and these

should be as plain as possible so that they can be kept clean. Fresh air and sunlight should be let in as much as possible. Now and then the room should be fumigated whenever the occupant is away.

People who live in the same house as the consumptive should not sleep in the same room. They must try to avoid infection when the patient coughs, and should wash their hands frequently, especially before meals. They should also wash after touching anything belonging to the patient, e.g. eating and drinking utensils, and these should be boiled after use. *Marriage:* Any active tuberculous disease in a girl is a definite contra-indication to marriage, or more particularly to pregnancy. Often the tuberculous disease seems to be arrested during pregnancy, only to flare up after the birth of the child, and the result is frequently fatal. An abortion may be necessary in the mother's interest, though even when procured early in the pregnancy there is always some risk that the tuberculous disease may be aggravated. *Lactation:* The feeding of an infant at the breast by a woman who has active consumption should not be permitted both in the interests of the mother and of the child. In the mother's case, nursing is a drain which she can ill afford to undergo, and which will accelerate the disease; in the case of the infant, infection from the mother is a real danger, and it must be remembered that the earlier the age at which the infant is infected the worse is the outlook.

No child has ever been born suffering from tuberculosis when the mother is afflicted, but many catch it at an early age. A child born of a consumptive parent should, in its own interest, be separated from the parent affected and brought up in the country. It should exchange the town life for a country life; indoor for outdoor life; warms baths for outdoor bathing; mental activity for physical exercise: to sum up, it should live a natural life. At a later stage the child should attend an open-air school.

Tuberculosis is not transmitted as a hereditary disease, but there is a greater tendency to develop the complaint in children born of infected parents or parent.

Tuberculosis of joints is most common in childhood and early youth, but it may occur at any age and is not uncommon in old people. It is a chronic condition and comes on insidiously, and when established there is swelling of the joint ("white swelling"), pain on movement, and the limb is often drawn up (by the pull of the muscles); at a later stage there is destruction of the joint, and deformity results. General signs of tuberculosis, such as evening rise of temperature, night sweats, and wasting, are also present. When the diagnosis is made early by the doctor and time not wasted by people considering the condition "rheumatism" or "growing pains," the outlook is favourable, though treatment is always prolonged.

Treatment.—The joint is usually fixed in a useful position by means of a carefully moulded plaster of Paris splint or other apparatus and kept absolutely immobile for at least six months after the active disease has settled down, and may take up to two or three years. Open air and sunlight are essentials in treatment.

TUFFNELL'S DIET.—This is a diet sometimes used in the treatment of an aneurism of the aorta, i.e. a dilatation of the large artery which comes directly from the heart. The idea is to restrict the intake of fluids. The diet consists of 2 oz. of bread and butter, and 2 oz. of milk or cocoa for breakfast; 3 oz. of cooked meat, 3 oz. of bread or potatoes, and 4 oz. of water for dinner; 2 oz. of bread and butter with 2 oz. of milk, tea or cocoa for supper. It is a very frugal diet, and few patients can endure the restriction for long.

TUMOUR.—In a popular sense, a tumour refers to any abnormal swelling in the body, but pathologically it refers to an abnormal growth of cells and is sometimes also termed a neoplasm or new growth. The cell growth resembles the cells of the tissues from which it is developed, but these new cells serve no useful purpose and grow at the expense of the body. Overgrowth of cells may occur in certain diseases such as syphilis or tuberculosis, but these new cells do not resemble the normal cells of the body and may serve a protective purpose.

Any tissue of the body can develop a tumour, and tumours are classified according to the type of tissue involved. Broadly, there are two main classes: the connective tissue tumours and the epithelial tumours. These, in turn, can be each divided into malignant and benign (harmless) tumours according to whether they are a menace to

life or not. Tumours are also named according to the name of the actual tissue affected. Thus, there are *lipomas*—fatty tumours; *fibromas*—fibrous tumours; *angiomas*—blood-vessel tumours; *neuromas*, nerve tumours, and so on. Sarcomas are so called because to the eye their substance resembles a fleshy mass. Carcinoma is a cancer, and is so called because processes grow out from the parent tumour like the claws of a crab.

The actual causation of tumours is unknown and it is probable that a variety of causes are operative. Some form of irritation, chemical or bacterial, is certainly very often a precursor of cancer. This is most noticeable in chimney-sweeps' and paraffin-workers' cancer. Also, cancers can be produced artificially in animals by the application to the skin of irritant tars. Some tumours are probably of embryonic origin, i.e. groups of cells get misplaced during development within the womb and in later life they commence to grow in an uncontrolled manner. Teratomata probably arise in this way.

Many tumours are quite harmless and only produce symptoms when their bulk interferes with the work of an organ. Others, however, grow very rapidly, infiltrating the organ in which they originate and spreading to other parts of the body by the transit of tumour cells in the blood stream or in the lymphatic channels. Secondary growths are set up and tissues and organs are destroyed by these new growths. Cancers and sarcomas are tumours of this type and are consequently destructive to life. Innocent or benign tumours grow very slowly, while the reverse is the case with the malignant variety.

The appearance of a tumour need not be a cause for alarm but it is always advisable to seek medical advice immediately. In a majority of cases, the person concerned will be reassured that the tumour is harmless; but should the verdict be otherwise the chances of cure are very much greater in the early stages of a malignant tumour as compared with the later stages. Pain does not necessarily accompany a tumour, but that in itself is not evidence that the tumour is harmless. The early stages of cancer are nearly always painless. Simple tumours are only removed if they are disfiguring or are pressing on some organ. With malignant tumours early removal by surgical operation, along with radium treatment, are essential as soon as they are detected.

TURKISH BATHS.—*See* BATHS.

TURMERIC.—This is a yellow vegetable dye which is dissolved in alcohol to form a tincture. In the presence of alkalies the yellow paper turns a reddish-brown in colour. Turmeric is also used as a colouring agent for ointments and other pharmaceutic preparations.

TURPENTINE.—The oil of turpentine is obtained from several species of pine found chiefly in America, Russia and France. It is distilled from the resin and occurs as a colourless agent with a characteristic odour and a pungent taste; it is insoluble in water but freely soluble in alcohol. If applied externally to the skin turpentine is a counter-irritant, producing redness and a feeling of warmth. It is therefore commonly used as a liniment for applications to sprained or injured joints and to the muscles and joints affected by rheumatism. It may be rubbed into the tissues or the turpentine may be sprinkled on a fomentation. Internally, turpentine is sometimes used to kill intestinal worms, especially the tapeworm. It is a dangerous drug to use internally, however, as it has a powerful irritant effect upon the delicate mucous membranes. It is also absorbed and, being excreted by the kidneys, produces an intense inflammation of these organs, as shown by the presence of blood and albumin in the urine. If an overdose of turpentine is taken, an emetic (salt and water) should be given at once and, after it has acted, a dessertspoonful of Epsom salts in water. Barley-water should then be drunk freely to relieve the irritation in the stomach. If any pain in the kidney region arises, apply hot poultices.

There are two official preparations of turpentine, both liniments: one, acetic turpentine liniment, is clear; the other, containing soap, is creamy in consistency. (*See also* RESIN; TEREBENE.)

TYMPANITES.—This term is used to denote distension of the abdomen (belly) as a result of the presence of gas, or air, in the intestines or peritoneal cavity. Normally, there is a certain amount of gas in the intestines, but under certain conditions it becomes excessive in amount. In constipation there is an abnormal degree of putrefaction in the bowel, and this tends to

excessive gas formation. Certain foods such as peas or beans tend to excessive gas formation, but in both such cases tympanites is unlikely to arise unless the abdominal muscles are very weak or thin. Tympanites is especially liable to arise when the bowel muscle is weakened or paralysed through the absorption of poisons. This occurs in general peritonitis and notably in typhoid fever. It may also arise after an abdominal operation, as a result of shock, and in association with intestinal obstruction. Occasionally it occurs as an hysterical symptom.

In tympanites, the abdominal wall is arched outwards and tense, and if tapped presents a drum-like note. It is liable to disturb the action of the heart and, as it is in most cases evidence of definite disease, medical advice should be obtained immediately.

Treatment.—An enema of soap and water with a dessertspoonful of turpentine may be given or poultices may be applied to the abdomen. Sal volatile or oil of peppermint by the mouth may be helpful in some cases.

TYMPANUM.—This is the middle ear, an air-filled cavity in the temporal bone of the skull. It lies just behind the ear-drum or tympanic membrane and contains a chain of three small bones, the malleus, the incus and the stapes, which lead from the drum to the internal ear and probably have a protective function. It also contains two tiny muscles which act upon the ossicles. The tympanum communicates with the throat by a small canal called the Eustachian tube, and is also connected with the air-cells in the mastoid process of the temporal bone. (*See also* EAR.)

TYPHOID FEVER.—This is an acute disease characterized by a special ulceration of the small intestine, with the eruption of rose-coloured spots, and a typical course of temperature. It is caused by a germ, the typhoid bacillus which is a rod-shaped organism with a number of whip-shaped processes—flagellæ—enabling it to move. The bacillus is found in the blood, some of the organs, and in the urine and stools of typhoid patients, and it may persist in these excretions for many years after recovery. Such a person who harbours the bacilli is called a typhoid carrier and may be a menace to the community by spreading infection.

The infection is spread chiefly through the drinking of contaminated water, milk, food (particularly shell-fish), uncooked vegetables and ice cream. Flies and other insects may be the agents of infection by feeding on infected sewage and transferring the bacilli to water, or food. Typhoid fever is most common in adolescents but it occurs in all ages of life. It is found in all countries and tends to be most prevalent during hot weather.

Symptoms.—After infection, there is an incubation period of from one to about two weeks. Then the disease shows itself rather insidiously by headache, feeling of tiredness, nose bleeding and abdominal pain. Fever appears and the temperature steadily rises during the first week, each night the temperature being higher than the preceding night (Staircase temperature.) The pulse is slow, tongue white and coated, and constipation is more common than diarrhœa. The rash makes its appearance at the end of the first week and consists of isolated rose-red spots, slightly raised but disappearing on pressure. They appear first on the abdomen and may spread to the chest and limbs. During the first week the glands in the small intestine (Peyer's patches) are becoming inflamed and by the second week they have become ulcerated. Then the patient begins to look seriously ill and exhausted. The face is very pale with flushed cheeks. The tongue is dry, the sufferer dull and listless. Diarrhœa sets in and the motions are pea-soup-like with an unpleasant odour and often containing blood. The abdomen becomes distended and tender, the temperature continues high, the pulse rapid and sometimes weak.

During the third week the symptoms depend upon the severity of the ulceration. In a severe case the abdominal signs become more marked and the patient becomes prostrated and emaciated. Disturbance of the nervous system is shown by delirium, muscle tremors, drowsiness, and, in extreme cases, coma or unconsciousness. It is at this stage that there is a grave danger of perforation of the bowel and of intestinal hæmorrhage or bleeding. Should this arise, the outlook is very bad.

In a favourable case, towards the end of the third week the temperature begins to fall gradually, and the other symptoms subside. The diarrhœa passes off, the tongue becomes

clean, and the convalescent stage is reached by the end of the fourth week. During this period great care has to be taken with the diet, as an injudicious meal may readily induce a relapse.

The diagnosis of typhoid fever in the early stages is by no means easy as it may be mistaken for pneumonia, generalized tuberculosis or even appendicitis. Fortunately, if typhoid is suspected it is possible to confirm the diagnosis by means of a laboratory test, as the blood of typhoid patients gives a special reaction within ten days of the onset of the disease (Widal test). Also, it may be possible even earlier to cultivate the typhoid bacilli from a sample of the suspected person's blood.

Complications.—It has already been noted that perforation of the bowel and hæmorrhage may arise during the third week of the disease. These are revealed in the case of the first, by abdominal pain and collapse, and in the case of the second by the temperature falling to subnormal, the patient becoming collapsed, and sometimes blood being passed by the bowel. Other complications include gall-bladder inflammation, pneumonia, pleurisy, meningitis, abscesses in the bones or joints, and a painful condition of the spine (typhoid spine) due to an inflammation of the cartilage discs between the vertebræ. Thrombosis (clotting of blood) may also arise in the femoral vein of the leg during convalescence.

Paratyphoid fevers.—These are illnesses which closely resemble the less severe forms of typhoid. They are caused by two different organisms or germs, paratyphoid A and paratyphoid B, and infection is acquired in much the same way as in true typhoid. The diagnosis is dependent upon bacteriological examination in the laboratory.

Treatment.—It is usually advisable for a typhoid patient to be nursed in a special hospital. This is particularly advisable, as complications may arise which necessitate immediate attention on the part of the physician or surgeon. Special care is essential in the management of typhoid patients to disinfect all the body discharges and soiled clothing to prevent spread of infection. As there is an inflammation of the bowel, only a minimum of food should be given. Two to three ounces of peptonized milk should be given every two or three hours, but this should vary according to the digestive powers of the patient. Water can be freely given, and, to break the monotony of the milk diet, small quantities of beef tea and chicken broth. Attention to the skin is important, a cold antiseptic lotion being used frequently, and care should be taken, especially in prolonged cases, to prevent bed-sores. If the temperature is high, cold spraying or even cold baths are very beneficial. There are no specific drugs of value in the treatment of typhoid, though intestinal antiseptics such as beta-naphthol and oil of cinnamon may be given. Distension of the abdomen (tympanites) can be treated by giving oil of cinnamon by the mouth in 2–5 minim doses and by applying turpentine fomentations to the abdomen. Any constipation during the course of the disease should be treated by enemata and not purgatives, as these may irritate the bowel and lead to perforation. Stimulants may be necessary, but these are to be given with great discrimination. During convalescence, diet must be carefully supervised, and all solid food strictly avoided. The nursing of a case of typhoid fever is most important, the issue very often being determined by this factor. It calls for great skill and vigilant supervision.

Prevention.—Since water supplies have been carefully controlled and food supplies inspected by public health authorities, the occurrence of typhoid fever has greatly diminished. Yet the disease is by no means uncommon in the country, and there is a danger when water is used from shallow wells or streams which may easily become polluted or infected. Control of the fly pest is another means of eliminating the risks of typhoid infection, and careful sewage disposal is operative The possibilities of infection from oysters and mussels which have been contaminated are being diminished by special methods of purification, and the danger from this source is far less than formerly. The carrier difficulties are hard to overcome, as such a person may remain undetected for a long time. Should such a carrier be found, it is essential that he or she should have nothing to do with the handling or preparation of food, and should be instructed on the methods of sterilizing the urine and fæces. During epidemics, there may be very mild cases who are able to get about and

are possible sources for spreading the disease —a type called ambulant typhoid. If the disease is prevalent in an area, protection can be obtained by inoculation with anti-typhoid vaccine. The vaccine is usually prepared to protect also against the para-typhoid infection, and is called the T.H.B. vaccine. This gives certain prevention for about two years and, should the disease develop, it is of a very mild kind.

TYPHOID STATE.—This is the expression used to denote the profoundly exhausted condition which may arise during any severe feverish illness and which resembles the prostration of typhoid fever. The patient generally lies upon his back, with eyes open and staring, and oblivious to anything. The tongue is very dry, brown and cracked, and the lips and teeth become covered with collections of mucus (sordes). The pulse is rapid, feeble, and the respiration shallow. Very often there is a muttering delirium, and the patient keeps plucking nervously at the bed-clothes or makes passing movements in the air with his hands. Sometimes the bowels and bladder are emptied quite involuntarily. The patient has a peculiar tendency to slip downwards in the bed. The typhoid state is exceedingly dangerous, but not inevitably fatal. A great deal can be done by skilled nursing and medical attention. The time of greatest danger is the early hours of the morning when the body vitality is naturally at its lowest ebb.

TYPHUS FEVER.—This infectious disease, once very prevalent in this country, is now fortunately very rare. It has been all but conquered by cleanliness and sound sanitation. Typhus is still fairly prevalent in certain parts of the world, and during the Great War occurred in epidemic form in Serbia. It has been variously described as spotted fever, putrid, jail and hospital fever. Essentially, it is a disease of dirt, overcrowding, starvation and fatigue. The cause is believed to be a minute micro-organism and infection is definitely spread by lice.

Symptoms.—The onset is revealed after eight to twelve days by shivering attacks, aching pains in the head, back and limbs, a feeling of prostration and a rising temperature. The tongue becomes swollen and dry, the bowels are constipated, the face is flushed and somewhat dusky, and the eyes are bloodshot. The eruption or rash appears about the fourth or fifth day and shows itself as mottled mulberry-like spots, with tiny bleeding spots in some of them. It spreads over the trunk, back, and limbs, the face not usually being affected.

A peculiar smell is associated with the typhus patient, being described as resembling the odour of mice. As the disease advances the patient becomes more and more prostrate; he shows a characteristic vacant and apathetic look. There is a muttering delirium by day and night, and coma or unconsciousness may supervene at any time. The fever remains high until about the end of the second week, when in favourable cases, it abates by crisis, and there is a general improvement in the condition of the patient. The mind clears, refreshing sleep is obtained and there is a return of the appetite. Convalescence is very slow as there persists marked weakness and debility for some months.

During the fever, heart failure, bronchitis, broncho-pneumonia, meningitis, and excessively high temperature (hyperpyrexia) may arise as complications and may produce a fatal result. Bed-sores may also develop, and attacks of melancholia and mania sometimes complicate the convalescent period.

The diagnosis of typhus fever is not difficult during an epidemic, but solitary cases present some trouble. It may be confused with typhoid fever, but laboratory tests should be able to settle any confusion on this point. There is a test for typhus fever —similar to the Widal test for typhoid; it is called the Weil-Felix reaction.

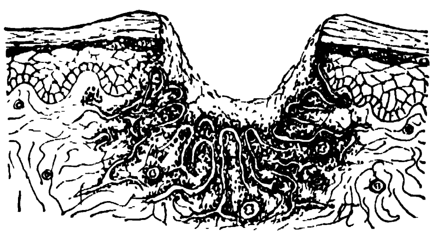
Treatment.—Strict isolation is essential in cases of typhus fever. Good nursing is vital. The skin should be sponged twice or thrice daily with some cool antiseptic lotion. The patient should be exposed to plenty of fresh air. In the acute stage the diet must be restricted to nourishing fluids. Stimulants in the form of whisky or brandy may be necessary at any time—especially at the crisis. Sleeplessness may require the use of hypnotic drugs.

Prevention of infection is dependent upon good sanitation, avoidance of overcrowding, personal cleanliness, and the careful isolation of infected persons together with thorough disinfection of their clothes and houses.

ULCER.—An ulcer may be described as an open sore resulting from inflammation on the surface of the skin, or on the surface of the membrane lining any cavity within the body. Death occurs in the tissues of the infected area, and because of this loss the ulcer is usually depressed below the surface of the healthy tissue. Any irritation to the skin may cause an ulcer to form, but the commonest cause of all is the presence of disease germs. Other factors which often encourage the development of ulcers are poorness of the blood, a general state of bad health, or poor circulation which leads to varicose conditions of the veins. Constant pressure or friction is liable to cause ulceration of the skin, for example, bed-sores. Any malignant growth, cancer or sarcoma, is liable to break down and ulcerate. Rodent ulcer is the chief amongst these malignant ulcers and usually is situated on the face.

Varieties.—Ordinary simple inflammatory ulcers are usually rounded, depressed areas consisting of a "floor" or surface covered with greyish-yellow material, from which there is a discharge. The surrounding parts are red and swollen, and there is a blue line which marks the edge of the healthy tissue. When the destructive process has ceased, the ulcer becomes cleaner and the floor is more or less covered with red granulation tissue. The parts surrounding the ulcer then become less angry-looking and the discharge is more watery in appearance.

When healing the new tissue contracts, giving a puckered appearance to the scar and the edges show the blue line of advancing healthy skin. Ulcers may be described as *local* when they occur at one spot only, and *constitutional* when there are several of them on different parts of the body. Constitutional ulcers are generally the result of some disease such as syphilis, tuberculosis, anthrax, Oriental sore, and yaws, and they are known as *infective ulcers*. Local ulcers include many varieties according to their symptoms and appearance. *Callous* or *indolent ulcer* is the commonest type and it occurs chiefly on the legs of women in middle life. They are often of considerable size and the edges are thick, hard, and raised above the surface. There are few granulations, and the discharge is thin and small in amount, but is often offensive and irritating. *Irritable ulcer* is one which is very painful, especially at night, and they appear to be commonest about the ankle. *Weak ulcers* are met with in weakly people, especially those suffering from dropsy. In this type the ulcer is soft, bleeds easily, and the granulations project above the surface forming what is popularly known as proudflesh. *Varicose ulcers* are met with on the legs of patients who suffer with bad varicose veins, and there is danger of the vein rupturing and severe bleeding occurring. The ulcer itself may belong to any of the above mentioned types but it has a tendency to develop into a callous ulcer. *Internal ulcers* tend specially to develop in the mouth, stomach and intestines. *Gastric ulcer* is fully described under GASTRIC or STOMACH ULCER and ulcer of the upper



Cross Section of Ulcer

part of the intestine will be found under DUODENAL ULCER.

Treatment.—For ordinary inflammatory ulcers the treatment consists of rendering the part clean with moist, warm, antiseptic applications, such as acriflavine, carbolic lotion, or perchloride of mercury solution, and the dressing covered with oiled-silk. As soon as the ulcer is rendered clean, these antiseptics must be stopped, as they interfere with the healing processes. The importance of complete rest cannot be too strongly emphasized and the patient should be given good nourishing food and tonics. *Weak ulcers*, or any ulcer in which the granulations are too prominent and above the level of the surrounding skin, may be treated with blue stone (copper sulphate), silver salts, or other substances which have a reducing effect upon the proudflesh. Once an ulcer has reached the healing stage, all that is necessary is to keep the surface clean and free from irritation and as much rest as possible must be given to the part. The ulcer may be kept covered with a piece of lint spread over with boracic

ointment, or an elastic plaster bandage may keep a zinc gelatin dressing on the leg. The usual interval allowed to elapse between dressings is two days, but if there is any discharge or if the ulcer is not clean, the dressing must be changed oftener. The lint must be thoroughly soaked before removal, and never pulled away roughly. The healing of a large ulcer, after it has been rendered clean, may often be hastened by grafting its surface with skin from another part of the body. (*See also* DUODENAL ULCER; GASTRIC ULCER; GRANULATION TISSUE; LUPUS; PROUDFLESH.)

ULITIS.—This term is applied to inflammation of the gums. (*See also* GINGIVITIS; GUMS, DISEASES OF.)

ULNA.—The inner of the two bones which form the skeleton of the forearm is known as the ulna, and when the palm of the hand is turned upwards it can be traced with the finger from the point of the elbow down to the wrist. At the lower end of the ulna is a small rounded knob which stands out prominently, especially in thin people. (*See also* BONES; FRACTURE; ARM; ELBOW.)

ULNAR.—The *ulnar artery* is one of the branches of the brachial artery which supplies the upper arm. It commences at the elbow, passes down the forearm and eventually joins the arteries which supply the palm and fingers. The *ulnar nerve* lies very close to the ulnar artery and the two structures travel together down the forearm into the palm. This nerve supplies sensation to the palm and back of the hand and to the little finger and ring finger. Injury to the nerve may cause serious disability to the inner part of the hand, causing a condition known as claw-hand or griffin-hand. A blow on the elbow causes a peculiar sensation to shoot down the forearm, hence the popular name of "funny-bone" to this part. (*See also* ARM; ELBOW; FINGERS.)

ULTRA-VIOLET RAYS.—The invisible rays of light given off at the higher (violet) end of the spectrum are described as ultra-violet rays. They have a powerful action upon all forms of life, and nowadays are greatly used in the treatment of many diseases and conditions. (*See also* LIGHT TREATMENT; SUN-BATHING.)

UMBILICUS.—More commonly referred to as the navel, the umbilicus is the little depressed button-like scar lying somewhat below the middle line of the abdomen. It represents the separation of the umbilical cord, which is the means of communication between the mother and the developing child while it is still in the womb. (*See also* CORD; HERNIA; RUPTURE.)

UNCONSCIOUSNESS.—Insensibility or unconsciousness is a state which may occur from a number of different causes directly or indirectly affecting the brain. The most common cause for a sudden loss of consciousness is known as apoplexy, and it is discussed fully under its own heading. Another cause of unconsciousness is the presence of poison in the blood stream. Such poisons as opium or cocaine may be deliberately taken into the system; and, of course, alcohol is one of the chief of the narcotic poisons and is responsible for a great many cases of poisoning. The poisons which accumulate in the system during various diseases such as diabetes and Bright's disease (nephritis) may produce unconsciousness. The treatment of each case will depend on the cause of the condition; but, apart from general first-aid treatment, it is unwise to treat a case without medical advice. (*See also* APOPLEXY; COMA; EPILEPSY; FAINTING; FIRST-AID SUPPLEMENT; FIT; HYSTERIA; SHOCK.)

UNDERFEEDING. — Habitual underfeeding may lead to a general state of ill-health, and it is a common cause of irritability and weakness in children. Many mothers are not aware that their children are being underfed, and they wonder why the baby cries all day long. This condition may arise in cases of breast-fed babies where the mother's milk is not nourishing enough. (*See also* DIET AND INVALID COOKERY; INFANT FEEDING.)

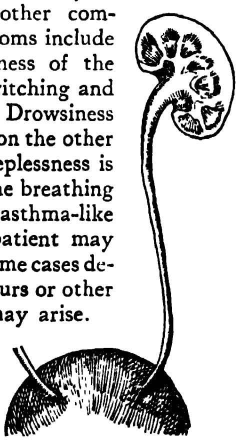
UNDULANT FEVER.—This disease is more commonly known as Malta fever, Mediterranean fever, or Rock fever. The condition is discussed fully under the heading MALTA FEVER.

UNGUENTUM.—This is the Latin name for ointment. (*See also* OINTMENT.)

URACHUS.—A fibrous cord which passes from the bladder to the umbilicus is known as the urachus. It represents the remains of the canal which, in the unborn child, joins the bladder with the allantois, one of the fœtal membranes. (*See also* EMBRYO; FŒTUS; LABOUR and CHILDBIRTH.)

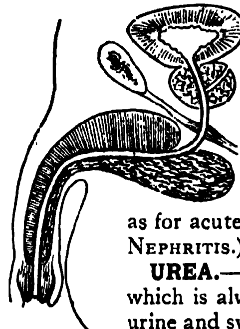
URÆMIA.—This is a poisonous condition of the blood which arises in diseases of the kidney. The poisonous materials which normally should be passed in the urine are retained in the blood, and many serious symptoms are produced in consequence. Uræmia is one of the most serious results of chronic Bright's disease (nephritis), but it may occur in other diseases of the kidney, such as stone in the kidney or tuberculous disease, or in some cases where there is suppression of the urine, or, when the kidneys are sound, from an enlarged prostate or other cause of retention of urine.

Symptoms.—In cases that develop in a few hours or days the term *acute* is given; while the *chronic* type includes cases in which the symptoms are less severe and may last over weeks, months, or even years. The chief symptoms of uræmia are nausea, vomiting, and diarrhœa; headache, shortness of breath, muscular twitchings, convulsions, and unconsciousness. There is no sharp dividing line between the acute and the chronic types, and chronic uræmia is liable to develop into the more severe or acute form. Headache is the most constant and earliest symptom and it may be very severe in character. Convulsions may occur without any warning, and other common nervous symptoms include tingling and numbness of the fingers, muscular twitching and cramps in the legs. Drowsiness may be present, but on the other hand persistent sleeplessness is not uncommon. The breathing assumes a peculiar asthma-like character and the patient may gasp for breath. In some cases delusional insanity occurs or other mental symptoms may arise.



Ureter:
Showing connection between kidney and bladder

Treatment.—The treatment of uræmia includes all the measures which are taken in cases of chronic nephritis Treatment must be carried out quickly and well if the patient's life is to be saved. The main endeavour is to get the skin and bowels to act freely so as to relieve the kidneys as much as possible, and this is done by hot baths or hot packs and drugs which encourage sweating. The bowels may be started to act by a hot-water enema or by giving a strong dose of magnesium sulphate or some other powerful and quickly-acting purgative. If the patient recovers from acute uræmia, the after-treatment and diet are the same as for acute nephritis. (*See also* NEPHRITIS.)



Urethra

UREA.—Urea is a compound which is always present in the urine and sweat; but in disease, especially disease of the kidney, it may be greatly increased. One of the uses of this compound is to stimulate the functions of the kidney, and it is sometimes given for this purpose in cases of dropsy of the heart or in kidney disease. The hypnotic drugs known as veronal, dial, medinal and luminal are very closely allied to urea. (*See also* HYPNOTICS.)

URETER.—The ureters are two in number, and they are the tubes which convey the urine from the kidneys to the urinary bladder. Each ureter measures from ten to twelve inches in length and they are lined by a delicate mucous membrane. Obstruction of the ureter may be a serious condition; it is usually caused by a stone from the kidney, giving rise to very intense pain. Twisting of the ureter may cause sharp attacks of abdominal pain, with nausea, and perhaps vomiting. (*See also* BLADDER; URINE.)

URETHANE.—Urethane is also known as ethyl carbamate, and it is made by heating nitrate of urea in absolute alcohol, afterwards extracting with water, then with ether, and finally redistilling. It is used as a hypnotic, and is often used to produce insensibility to pain. (*See also* ANÆSTHETICS.)

URETHRA.—In the male, the urethra is the tube inside the penis which extends from the neck of the bladder to the exterior. It measures from seven to eight inches in length and is the passage for both urine and seminal fluid. The female urethra is a narrow canal about one and a half inches long and it lies embedded in the wall of the vagina. Inflammation of the urethra is known as urethritis, and it is nearly always

due to gonorrhœa. (*See also* GLEET; GONORRHOEA; KIDNEY.)

URIC ACID.—Uric acid is present in the urine and blood and it is formed in the tissues by the chemical changes which protein foods undergo in the body. Its presence is greatly increased in disease, but whether this increase is a cause or a result of a particular disease has not yet been proved. People who suffer from rheumatism and gout very often have uric acid crystals deposited in the urine and these may give rise to severe colic or the passage of blood. But "uric acid" is not nowadays blamed for as many ailments as used formerly to be the case. (*See also* GOUT.)

URIDROSIS.—In some diseases of the kidneys an abnormal amount of urea is excreted by way of the sweat, and when this evaporates crystals are formed which give the skin a curious frosted appearance. (*See also* URÆMIA.)

URINAL.—A vessel for receiving urine is described as a urinal.

URINARY SYSTEM.—This consists of the two kidneys, the two ureters, the bladder and the urethra. These various parts are described under their own headings.

URINE is the watery solution excreted by the kidneys by way of the ureters to the bladder, which is emptied periodically through the urethra. It consists of waste substances which result from the activity of the body, and is normally of a pale yellow colour with a distinctly aromatic smell and a slightly acid reaction. It has a specific gravity by day of 1018, and by night of 1026 —water has a specific gravity of 1000; but the specific gravity of one specimen of urine is of no value as an index to health, and a 12 or 24 hours specimen is necessary to judge this. The amount of urine excreted by a normal adult in 24 hours is 50 ounces, about 38 ounces by day and 12 ounces by night.

The colour of urine may vary in different diseases and also after taking various drugs. A deposit may be due to phosphates or urates (which are of little or no importance), or may be due to pus or blood (which are important as indicating disease in some part of the urinary system). Black urine may be due to taking carbolic acid; green urine to bile or to taking methylene blue—blue urine may also be due to the latter drug; orange urine to taking santonin or rhubarb: pink urine to the presence of urates; and red urine to the presence of blood. Over-secretion of urine may be due to such diseases as diabetes or chronic Bright's disease (of the kidneys), but it may also be due to such comparatively trivial causes as nervousness or drinking too much tea or beer.

Under-secretion of urine is due to inflammation of the kidney, to such an operation as passing a catheter, or to various fevers, or it may be due only to sweating or violent exercise. It is a mistake to pay too much attention to the appearance of the urine or its amount, or its acidity or alkalinity. It is quite true that doctors place a good deal of stress on the chemical examination (the presence of albumin often denoting Bright's disease and the presence of sugar often diabetes), but the modern doctor wants to know much more than that before coming to a decision, for the heart and blood-vessels and the blood and tissue fluids are all closely connected with the urinary system. *Heller's test:* About half an inch of strong nitric acid is put in a test tube, and urine carefully poured in on top of it; if there is albumin in the urine a dense white line is formed where the two fluids meet. *Fehling's test:* A blue solution containing copper sulphate, Rochelle salt and caustic potash, which is boiled in a test tube and a few drops added of the urine being tested; if sugar is present a red and yellow deposit (of cuprous salts) is formed. *Benedict's test:* a pale blue solution, which contains copper sulphate, carbonate of soda, citrate of potash, and thiocyanate and ferrocyanide of potash, is boiled along with a specimen of urine, and if the colour disappears sugar is present in the urine, the amount of sugar depending on the amount of the Benedict's solution used and made colourless.

These are the commonest chemical examinations of the urine, but many other chemical examinations may be necessary, to ascertain the presence of proteins, globulin, mucin, hæmoglobin and its derivatives, bile salts, creatinin, uric acid, chlorides, etc. A microscopic examination of the urine may be necessary for blood or pus cells, casts, crystals, or bacteria; and a chemical and microscopical examination of the blood, and sometimes an examination of the heart and of the blood-pressure may also be necessary to throw light on certain disease-symptoms.

URINE, RETENTION OF.—*Retention* of the urine is the term applied to the involuntary holding back of the urine in the bladder on account of something preventing urination, although the urine is secreted by the kidneys; *suppression* of urine is an even more serious condition, as it is due to the failure of the kidneys to produce the urine, usually from acute inflammation of the kidneys or an acute fever. Retention of the urine, on the other hand, is usually due to an obstruction of the passage through which it should be passed, from a stricture, or a stone, or enlargement of the prostate gland at the neck of the bladder (common in old men), or to the shock of an operation or childbirth. Sometimes a warm bath will relieve the condition, but it is usually relieved by the passage of a sterilized catheter—which may have to be repeated frequently—or an operation. (*See also* CATHETER.)

URTICARIA.—This is popularly known as nettle-rash and it is characterized by weals on the skin. The eyelids or lips may swell and become very tense and painful. The nettle-rash may be preceded by digestive disturbances, and in some cases there seems to be a definite connection between an outbreak of the rash and the taking of certain foods such as fish, strawberries and various other substances. The condition of urticaria is considered to be an allergic disease, which means that certain substances are definitely poisonous to certain people. When the nettle-rash occurs the skin may feel intensely irritable, and rubbing tends to bring out the weals. Any alkaline application will be found soothing and baths containing bicarbonate of soda will relieve the itching. There is a form of the disease known as *giant urticaria*, or *angio-neurotic œdema*, in which sudden swellings may occur in the eyes, lips, mouth and throat. The eyes may be completely closed, or similar swellings may develop in the tongue or larynx causing very distressing symptoms. An injection of adrenaline should be given; but in swelling of the larynx intubation of the larynx may have to be carried out in order to save the patient's life. The condition known as *lichen urticatus* is a disease similar to urticaria, and the legs and trunk seem to be the chief sites of the eruption. Children, particularly, are affected with this condition and the rash sometimes resembles the blisters of chickenpox. The diet must be carefully gone into and the regularity of the bowels should be maintained. The affected parts should be sponged with bicarbonate of soda dissolved in warm water. (*See also* ALLERGY; ANAPHYLAXIS; LICHEN.)

UTERUS, or womb, is the hollow organ in which the development of the fœtus from the ovum takes place. (*See also* WOMB.)

UVULA is the small muscular mass that hangs down from the middle of the soft palate between the pillars of the fauces. In relaxed conditions of the throat it may be enlarged or elongated, usually due to unhealthy tonsils or an unhealthy condition of the nose, and when one or other of these is put right the uvula becomes normal again.

VACCINATION.—Vaccination is simply the introduction into the human body of the virus of cowpox, a modified form of smallpox, with the object of producing a mild attack of the disease and stimulating the natural resistance of the body to gain an immunity to smallpox. The material now used for vaccination is "glycerinated calf lymph," obtained from calves which have had cowpox and subsequently adding glycerine (to destroy any disease producing germs) to the material obtained from the calves. It is stored in fine glass tubes, and in the actual operation the skin of the arm or leg is first cleaned and two or four drops of lymph placed on the skin about one inch apart. The skin at these points is then gently scarified, not sufficiently deeply to draw blood, and the lymph then allowed to dry on the arm. In girls vaccination is frequently done on the leg or buttock to prevent disfigurement of the arm.

In about three days a small red pimple or papule appears which becomes a blister or vesicle by the sixth day, and, by the ninth or tenth day pus forms. Then the pustule dries up and a scab forms which falls off by about the fourteenth to twenty-first day, leaving a depressed scar. As a rule, in healthy

persons there is comparatively little constitutional disturbance, but occasionally there may be a certain amount of feverishness. The protection afforded by vaccination is not absolutely permanent in all cases, so that it is necessary to be revaccinated after the tenth year and again at the twenty-first year. Should smallpox be epidemic in a district it is generally advisable to be vaccinated, unless this operation has been carried out a short time previously. If a first vaccination is unsuccessful, another attempt should be made, as the lymph may have become inactive, but it is necessary to wait about four weeks after the first attempt. (*See also* SMALLPOX.)

VACCINE.—This term is used to describe preparations of the bodies of disease germs which are administered by injection under the skin with a view to preventing or curing certain germ diseases. In most cases, dead germs are used and the vaccine is so prepared as to contain so many germs to a cubic centimetre, so that accurate doses can be given. If the germs from which the vaccine is to be prepared are obtained from the patient's own body, the vaccine is termed *autogenous*. Most often *stock* vaccines are used, i.e. vaccines are made up from germs of various diseases, and are administered according to the kind of germ that is believed to cause the disease. (*See also* IMMUNITY.)

VAGINA.—This is the passage between the womb and the vulva or external genital organs in the female. It lies between the urinary bladder in front and the rectum behind, the urethra being embedded in the lower half of the front wall. The lower opening of the vagina is partially closed by the hymen in the virgin. Inflammation, or vaginitis, may be caused by gonococcal infection or by the presence of a foreign body such as a pessary or tampon. It may occur as a complication of measles, scarlet or other infectious fevers. There is generally a certain amount of discharge, and the passage may become painful and tender, according to the severity of the inflammation. Leucorrhœa, or "whites,". is the term applied to a discharge from the vagina.

In women who have borne children the walls of the vagina may prolapse, leading to the production of a *cystocele* or *rectocele*, i.e. part of the bladder or rectum pouch into the vagina. An operation is necessary to remedy this defect, but this is only advisable if no further children are expected. As a result of a difficult labour an opening or fistula may arise between the bladder and vagina so that incontinence of urine results. Less often a fistula may arise for the same cause between the rectum and the vagina. An operation is the only remedy. (*See also* DOUCHE; LEUCORRHŒA; REPRODUCTIVE ORGANS.)

VAGINISMUS is a condition of hypersensitiveness of the vulva and vagina which leads to painful spasms of the muscles at the entrance of the genital canal whenever any attempt at sexual intercourse is made. It may be caused by excessive smallness of the opening, rigidity of the hymen, or some painful inflammatory disorder of the parts. The treatment naturally depends upon the cause; sexual intercourse should be avoided until the condition clears up.

VAGUS.—The pneumogastric nerve is known as the vagus and is a very important nerve sending branches to several vital organs. (*See also* NERVOUS SYSTEM.)

VALERIAN.—From the root of the valerian plant—a native of Europe and North America—is obtained a volatile oil which has a strong and disagreeable smell and a bitter unpleasant taste. Owing to its evil odour and taste it has had a reputation for benefiting hysterical conditions and it is often prescribed along with bromides. The effect of valerian is purely psychological. The official preparation is the ammoniated tincture of valerian.

VALVE.—In the heart, veins, and lymphatics of the human body there are flaps of tissue which permit of the blood or lymph flowing only in one direction. Should the fluid attempt to flow backwards, the flaps are floated outwards and so block the passage. Such flaps are termed valves, and they are an essential part of the mechanism of the heart and veins.

VARICELLA.—Another name for the infectious disease chicken-pox.

VARICOCELE.—This is a dilated and twisted condition of the veins of the spermatic cord. These veins drain the testicle and its coverings, and the condition shows itself as a slight swelling in the scrotum which disappears when the patient lies down. It feels like a bag of worms, and the condition

occurs most often in the left side. Varicocele occurs in young adults and its production is favoured by constipation. Very often no symptoms are produced, but sometimes there is experienced a feeling of weight and discomfort—the latter occasionally amounting to a neuralgic pain. The discomfort is generally worse during vigorous exercise and during hot weather.

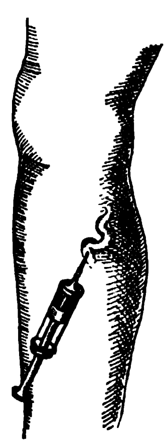
In mild cases, the best treatment for a varicocele is to ignore it; in more severe cases a suspensory bandage may be worn. The affection can often be relieved by cold baths, which have a bracing effect generally, and by attention to the bowels. If the condition is causing anxiety, an operation can be performed by means of which a portion of the venous network is removed. (*See also* SPERMATIC CORD; TESTICLE.)

VARICOSE VEIN.—A vein is called varicose when it is dilated, twisted and knotty in appearance. Actually, the twisting is due to the elongation of the vein. Many veins in different parts of the body can be so affected, but the commonest situation is the leg. Most often it is the saphenous vein which passes up the inner side of the leg and thigh which becomes varicose.

The fundamental cause of varicose veins of the leg is a hereditary weakness of the walls of the veins and of the valves. These valves are unable to withstand any extra call upon the blood circulation, so that they become incompetent and do not help to support the long column of blood. The result is that there is a certain amount of sluggishness of the venous return of blood—and sometimes a back flow so that the veins become dilated, lengthened and finally twisted. There are certain contributory factors which tend to produce varicose veins. Anything constricting the limb, such as tight garters, leads to this affection while the strain of standing for prolonged periods is a common precipitating cause. This explains the frequency of the condition in shop assistants and policemen. In women, the pregnant womb by pressing on the great veins in the pelvis may lead to varicose veins and similarly any abdominal tumour or even an overloaded bowel, as in constipation, may have the same adverse effect.

The earliest symptom is a feeling of weight and fullness in the limb after standing or a long walk. On examination, the veins will be seen to be prominent and, as the condition develops, the veins bulge out and are seen to be twisted and knotted under the skin. The feeling of weight increases and there is a marked weariness of the limbs after even a short period of standing. Nearly always there is a certain amount of swelling of the ankles, for the obstruction of the venous flow causes a local dropsy. This leads to impairment of the nutrition of the skin and blood pigment is deposited which is irritating. Any friction on the part is then apt to lead to dermatitis which may ultimately cause a breakdown of the tissues, or, in other words, a varicose ulcer.

There are two other possible complications. The thin skin over the dilated veins may rupture and so lead to bleeding which may be very free and, if occurring during sleep, might lead to a fatal result. It may happen also that clotting or thrombosis takes place, especially after an injury or during some infectious illness. In such a case, the clot may become changed into fibrous tissue, obliterating the vein and thus curing the condition, or fragments of the clot may get detached and block a vessel in the lungs or other organs.



Injection Treatment of Varicose Vein

A certain amount can be done to prevent this relatively crippling affection. Suspenders should always be worn instead of garters. Shop assistants and other workers who have to stand about a great deal should be provided with seats for occasional rests. Constipation can readily be prevented by appropriate dieting. During pregnancy, the weight on the veins can be relieved by periodic rests and by gentle massage of the limbs.

Treatment.—Once the condition is established, it is difficult to cure except by the modern method of injecting chemical substances which lead to obliteration of the veins, or by operation. In some cases, the varicose veins can be controlled by the wearing of an elastic bandage. This should be put on first thing in the morning *in bed*, and

should not be taken off again until the person is again in bed at night. The object sought after is to prevent a large column of blood from collecting in the veins and so further dilating them. Massage or gentle rubbing in an upward direction is also beneficial, but it must be carefully carried out so as to avoid injury to the veins. Should redness and pigmentation of the skin in the lower part of the leg develop, the part affected should be freely dusted with a zinc oxide and fine boracic powder. For the treatment of eczema and ulceration *see* under respective headings.

The most recent treatment for varicose veins is by the local injection into the veins of a solution of salicylate of soda or a quinine salt or soda morrhuate which produces a firm clot within the veins. This clot ultimately becomes hard and fibrous and so obliterates the venous channel. This treatment may take some time, but it does not necessitate the patient lying up and it prevents the need of a more extensive surgical operation. Some people might imagine that the formation of a clot in the vein might be dangerous, but this is not so, as there is no sepsis involved, and thousands of cases have been done in this country without fatality. (*See also* VEIN.)

VARIOLA.—The technical name for smallpox.

VARIX.—This is a technical expression used to denote a dilated, twisted, or varicose condition of a vein. If a vein communicates directly with an artery, as a result of a punctured wound, the expression aneurismal varix is applied; while a varicose aneurism means the communication of a vein with an aneurism. (*See also* ANEURISM.)

VASA VASORUM.—These are the tiny microscopic blood-vessels which supply the walls of the arteries and veins. Like all other tissues, the large blood-vessels require a constant supply of nutriment.

VAS DEFERENS.—This is one of the two main ducts of the testicle along which the secretion of that organ is conveyed to its temporary storehouse in the seminal vesicles.

VASELINE.—A variety of soft yellow paraffin, or petroleum jelly is known by the trade name of vaseline. It serves as a protective covering to the skin and is used as a basis for many ointments. Unlike fats of animal or vegetable origin, it does not go rancid.

VASOMOTOR NERVES.—The nerves which supply the muscle-coat of the blood vessels are termed vasomotor. They are derived from the sympathetic nervous system and there are two types, the vaso-constrictors and the vaso-dilators, the former diminishing the calibre of the arteries and the latter causing their relaxation. These nerves are antagonistic to each other and are controlled by a special centre in the medulla of the brain. Certain diseases are dependent upon disorder of these nerves notably Raynaud's disease, angio-neurotic œdema and some forms of asthma. Excessive stimulation of the vaso-constrictor nerve leads to high blood-pressure. (*See also* SYMPATHETIC NERVOUS SYSTEM.)

VEGETABLE FOODS.—*See* DIET; FOOD; VITAMINS.

VEGETARIANISM.—This is the dietetic system in which, strictly speaking, only vegetable foods are eaten. It is more generally used to denote the abstinence from all animal foods excepting milk, eggs and cheese. It is doubtful whether a purely vegetarian diet is completely satisfactory from the nutritional point of view, but when dairy produce is included a perfect diet which satisfies all the needs of the body can be obtained. (*See also* DIET; FOOD.)

VEGETATION.—In medicine, this term is used to denote small lumps or growths which arise as a result of some inflammatory process on the heart valves. (*See also* EMBOLISM.)

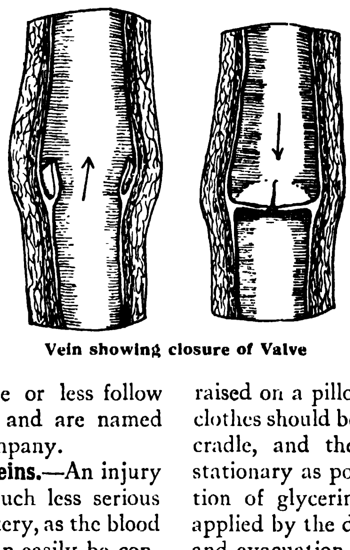
VEIN.—The tubes which carry the blood to the heart are called veins. They are similar in structure to the arteries, and possess three coats—an inner elastic lining, a middle muscular coat, and an outer covering of fibrous connective tissue. In contrast with an artery, the middle muscle-coat of a vein is much less developed, so that the vein collapses when empty while the artery retains its tubular form. The veins are provided with valves which permit the blood to flow in one direction only, the valves being floated back to close the vein if there is any backward flow of blood. A vein commences as a tiny tube which is connected with the microscopic blood vessels called the capillaries. These small veins or venules unite to form larger veins until the main venous trunks are formed. These are two in number, the superior and the inferior vena cava, and they open into the right auricle of the heart.

The superior vena cava is formed by the internal jugular and subclavian veins which unite to form the innominate veins, and the inferior vena cava is formed by the two iliac veins which drain the lower limbs and pelvis. In its course through the abdomen and chest, the inferior vena cava receives numerous tributaries.

The portal vein is important in that it drains the blood, rich in nutriment derived from the stomach and intestines, and carries this blood to the liver where the vein ends by breaking up into small capillary vessels.

The flow of blood in the veins is dependent upon a number of factors: there is the force from the heart carried through the arteries and capillaries; there is the action of the skeletal muscles which tend to drive the blood towards the heart, and there is the suction effect of breathing.

The blood in the veins is dark purplish in colour, for much of its oxygen has been lost to the tissues. There is one exception to this in the case of the pulmonary veins which take the pure oxygenated blood from the lungs to the heart. The veins more or less follow the course of the arteries and are named after the arteries they accompany.



Vein showing closure of Valve

Diseases and injuries of veins.—An injury to a vein is generally a much less serious affair than an injury to an artery, as the blood flows slowly and the flow can easily be controlled by pressure. Bleeding from a large vein, however, such as a ruptured varicose vein in the leg, may be dangerous as also a wound of one of the large veins in the neck or armpit. In the latter case, there is the added risk of air being sucked into the vein, causing an air-embolus, and this may lead to death. Veins which have become dilated, twisted and knotty are termed *varicose.* (*See* VARICOSE VEINS.) Clotting of blood in a vein is termed *thrombosis;* it causes stoppage of the flow of blood; the vein swells and the function of the part involved is handicapped. This condition arises during the course of prolonged illnesses when the blood is in a septic state as in typhoid fever.

Inflammation of a vein is called *phlebitis.* It may be caused by septic germs circulating in the blood—or by such germs contaminating a wound in the vicinity of a vein. This is a relatively dangerous condition as clotting is apt to take place and should portions of this clot become detached, abscesses may be formed in different parts of the body (Pyæmia). A simple phlebitis may arise in gouty and anæmic persons, and it may also occur in connection with varicose veins or in veins in which there has long been a sluggish circulation of blood as in typhoid fever. Injury may produce a simple phlebitis, and it may follow thrombosis or clotting in a vein.

Symptoms.—The onset of phlebitis is marked by pain and tenderness along the line of the vein which becomes hard and cord-like to the touch. The skin over the vein is reddened and may be swollen. If a large vein of the leg is involved the limb becomes swollen and hard, and there is generally some degree of fever.

Treatment.—This demands rest in bed; in the case of the leg vein, the limb should be wrapped lightly in cotton-wool and raised on a pillow. The weight of the bedclothes should be relieved by means of a bed-cradle, and the limb should be kept as stationary as possible. A soothing application of glycerine and belladonna may be applied by the doctor. Diet should be light, and evacuation of the bowels regularly carried out. Frequently, large doses of potassium citrate are given to diminish the risk of clotting in the vein. If the response to treatment is satisfactory, within a fortnight to a month after the symptoms have subsided the patient may get up from bed—but the danger of clotting is always to be borne in mind. Massage and gentle movements are beneficial at this stage. (*See also* CIRCULATION OF BLOOD; THROMBOSIS; WHITE LEG.)

VENA CAVA.—The two great veins which collect all the blood from the whole of the body and pass it into the right auricle of the heart are called the superior and the inferior vena cava. (*See also* VEIN.)

VENEREAL DISEASE.—A disease acquired through the act of sexual intercourse

is termed a venereal disease. Into this category come *syphilis*, *gonorrhœa* and *soft chancre* or sore. All these diseases are dependent upon micro-organisms or germs, and they may in a few cases be acquired other than venereally, e.g. by contact with infected towels in the case of gonorrhœa or drinking vessels in the case of syphilis. The occurrence of venereal diseases is one of the greatest of all social problems, yet they are essentially preventable diseases provided reasonable sanitary precautions are taken. (*See also* GONORRHŒA; SOFT CHANCRE; SYPHILIS.)

VENESECTION.—The operation of opening a vein to allow the escape of blood for the treatment or diagnosis of disease is termed venesection or blood-letting. Formerly, it was a very popular method of treatment for a great variety of diseases, but nowadays its use is very restricted. (*See also* BLEEDING.)

VENOM.—This term is applied to the poisons secreted by reptiles and insects. (*See also* BITES; SNAKE BITE.)

VENTILATION.—Ventilation is not a draught, but continuous changing of the air.

Why air should be kept moving.—We should not breathe second-hand air. Such an atmosphere makes us sleepy and dull; it does not stimulate our nerves or our brains, and we are very likely to catch a cold in a stuffy place! For the air we have been breathing is full of all sorts of things that have no business there—dust, made up of particles of scales of human skin, perspiration, tiny threads of cotton or wool, floating bits of dead vegetation—to say nothing of the poisonous gas we give off from our lungs when we breathe out, or the disease germs that float in great numbers in the heavy atmosphere.

No need for draughts.—A draught is a quick little current of air that blows on one spot—the neck, perhaps, so that a stiff neck results—or on the floor, making the feet cold while the head is burning because the air above is so heavy. For hot air rises—this is why we open our windows at the top to let it out, while the fresh air comes in by way of the lower part of the window. What we want to do is to let the bad out and let the good in, without creating a draught.

The living-room.—Leave the chimney open, do not shut down the register. Even if there is no fire burning in the grate, the shaft of the chimney will draw up the bad air. We can let in the fresh air by opening the window—and there will be no draught if a strip of wood the same width as the window, and about three inches deep, is put at the bottom of the window, so that it fills up the space of three inches below the lower sash, which fits down on to it. Now, with the lower sash pushed up those three inches, the good outside air will come in; to get more of it, the window may also be opened at the top. There will now be a regular system of bad air going out and good air coming in, by which means the air of the room is constantly and gently changed. That is the secret of ventilation.

The bedroom.—Good ventilation is of even more importance here. No one should ever sleep in a room with a tightly-shut window. Even in a high wind a curtain will prevent draughts.

The sick-room.—In a small house it is sometimes difficult to keep the patient out of draughts, but there is usually space enough for the bed to be neither between door and window, nor between window and fireplace if there is one; if so, this is the place for it. When the window is open the door should be closed. Ventilating by way of the door is not a good plan, for the air of the house is not likely to be so pure as that outside. It is best to open the window at the top and use a board such as that described above, below the lower sash. If outside air is allowed to come in at the bottom of the window, it will chill the air below the patient's bed.

VENTRICLE.—The literal meaning of this word is "little stomach," and it is used to describe two of the muscular chambers of the heart, the spaces in the brain filled with cerebro-spinal fluid, and to certain spaces in the larynx or voice box.

VERATRINE.—This is the alkaloidal drug in the form of a pale grey-poisonous powder with a bitter acrid taste. It has no odour but is irritating to the nose, causing sneezing if inhaled. It is occasionally used in the form of an ointment for application to the skin to relieve the pain in neuralgia.

VERMIFUGE.—This is the term applied to any agent which expels intestinal parasites or worms from the body. (*See also* WORM.)

VERONAL.—This is a drug which has a sedative or calming effect upon the nervous system and helps the production of sleep.

Its chemical name is barbitone and it occurs as a white crystalline powder; it is commonly given dissolved in warm milk and the dose is approximately five grains. As its action is sometimes uncertain, and even small doses may have unexpectedly severe effects, it should be taken only under medical advice. Veronal is of little value if the sleeplessness is caused through physical pain. In susceptible persons it may produce a skin eruption, and in large doses it has a very depressing effect upon the nervous system and upon the heart. In veronal poisoning there is deepening coma or unconsciousness with shallow breathing and coldness of the body.

In the case of an overdose of veronal the patient should be given an emetic of mustard and water, if conscious, and a cup of hot strong coffee. If unconscious, an enema may be given and warm coffee may then be injected into the bowel. Hot blankets and hot-water bottles should be applied and the patient carefully watched for signs of heart failure. (*See also* HYPNOTIC; POISONING.)

VERSION.—This is the term used to describe the operation of turning the child within the womb to enable it to be born in the normal manner. (*See also* CHILDBIRTH; LABOUR.)

VERTEBRA.—The back bone is made up of a number of segments each superimposed upon the other and the individual bones are called vertebra. There are thirty-three vertebræ, varying in size and shape, but they are all constructed on a similar plan.

There is a rounded or oval body from which two portions are directed backwards to form an arch which ends in a spine-like process. The body is composed of spongy bone, and between the bodies of the vertebræ are disks of fibro-cartilage, thus making a solid yet flexible column. Projecting from either side of the arch is a bony outgrowth called the transverse process, and in the neck region this is perforated for the transmission of the vertebral artery. On the arch there are also articular processes by which the arch of one vertebra joints with that of another. The superimposed arches with their ligaments form the spinal canal in which is placed the delicate spinal cord. There are seven cervical, twelve dorsal, five lumbar, five sacral and four coccygeal vertebræ. The neck vertebræ are small and permit of free movement. The first cervical vertebra is called the atlas and it joints with the occipital bone of the skull. The second cervical vertebra is called the axis. To the dorsal vertebræ are attached the ribs. The lumbar vertebræ are very strong, while the five sacral vertebræ are fused together in early life to form a solid triangular bone. The coccygeal vertebræ are very small and insignificant and are often fused together.

The vertebral column may be affected by tuberculosis as in Pott's Disease, and it is sometimes the site of secondary cancer following cancer of the breast. Rheumatoid arthritis of the spinal column may also occur, converting the flexible column into a rigid, unbending mass. (*See also* POTT'S DISEASE; SPINAL CORD.)

VERTIGO.—*See* DIZZINESS.

VESICAL.—This is an adjective used to denote anything referring to the urinary bladder. Thus the blood vessels supplying the bladder are called the vesical arteries and veins, and a stone in the bladder is called a vesical calculus.

VESICANT.—*See* BLISTER.

VESICLE.—*See* BLISTER.

VIBURNUM.—From the bark of a black haw, Viburnum prunifolium, is obtained a medical preparation in the form of a liquid extract which is used as a sedative for the nervous system. It relieves muscular spasms and is most often used in menstrual disorders. The dose of the liquid extract is one to two teaspoonfuls.

VILLUS.—This is a small finger-like process which is found in the lining membrane of the small intestine. Villi are present in great numbers and give the interior of the intestine the appearance of a velvet pile. Each villus contains blood-vessels and one or more lacteals, small tubes which carry off the fat absorbed from the intestine. By means of villi the absorptive capacity of the bowel is greatly increased.

The term villi is also given to the small processes on the outer surface of the chorion, which is one of the membranes of the developing embryo in the womb. On one part the chorionic villi are greatly developed and form the placenta, by means of which nourishment is conveyed from the mother to the child.

VINCENT'S ANGINA.—*See* ANGINA.

VINEGAR.—This is a dilute solution of acetic acid containing varying amounts of

sugar, gum and colouring material. It is a by-product in the manufacture of wine. It is commonly used in the preparation of salads, the weak acid softening the cellulose fibres of vegetables and rendering them more easy of digestion. The addition of a toilet vinegar to water makes an astringent lotion which has a firming effect upon the skin and diminishes the disfigurement caused by dilated blood-vessels. (*See also* ACETIC ACID.)

VIROL.—This is a proprietary medicinal preparation containing bone marrow, malt extract, eggs and lemon syrup. It is a valuable food in the case of children suffering from malnutrition or convalescing from serious illness.

VIRUS.—This is the term which signifies the morbid poisonous material produced in the course of an infective disease, by which the disease can be reproduced when it is inoculated into another person. The virus may contain germs visible through the microscope, but in some cases these cannot be demonstrated though they are presumed to exist. Certain types of virus such as those of smallpox, rabies, and foot-and-mouth disease, are able to pass through a fine porcelain filter and they are described as filterable viruses. (*See also* BACTERIA.)

VISCERA.—This is the term applied collectively to the internal organs of the body. A single organ is described as a *viscus*.

VISCEROPTOSIS.—Sagging of the abdominal organs is termed visceroptosis. The condition is also known by the name Glenard's disease or abdominal ptosis. It is a fairly common complaint, being much more frequently observed in women than in men. The commonest age period is from 25 to 50 years. Normally, there is a certain range of movement permitted to the stomach, intestines and other organs, but, in visceroptosis, the movement downwards is excessive and the symptoms are produced. The actual displacement is due to several causes; stretching of ligaments, feebleness in the abdominal wall muscles, compression of the chest and upper abdomen by wearing tight corsets. Weak abdominal muscles may be result of underfeeding and lack of exercise, , in women, frequent pregnancies. Stretching or actual rupture of the floor of the pelvis during childbirth is another factor, for the pelvic floor normally gives considerable support to the abdominal organs. Rapid loss of fat, as in the case of some wasting disease, may cause visceroptosis because in health the organs are supported by pads of fat. Constipation, if chronic, also tends to lead to this condition.

Symptoms.—The severity of the symptoms does not correspond to the degree of the visceroptosis. Those who do suffer complain of a feeling of weight and dragging pain in the abdomen and loins, aggravated by the erect posture and by exertion, and eased by lying down. It is believed that these sensations are produced by dragging on the nerves contained in the peritoneal attachments of the organs. There are usually some dyspeptic symptoms, and, owing to the development of bands which tend to kink the intestines, symptoms of intestinal self-poisoning arise. In many of these cases, there develops a neurasthenic element which is a difficult factor to deal with in treatment.

If this condition of visceroptosis is suspected, on examination, the lower part of the abdomen will be found to be unduly prominent, especially in the erect posture, and it may be possible to detect the actual organ which is displaced by palpation. Should there be any doubt, an X-ray investigation after a bismuth meal will yield evidence of the existence of this affection.

Treatment.—If it is commenced sufficiently early, much can be done by toning up the abdominal muscles by massage and suitable graduated exercises. A belt or bandage may be worn. It is imperative to keep the bowels well open, and to this end a roughage containing diet should be eaten. The neurasthenic factor must also be treated by psychological methods. In some cases, the Weir-Mitchell treatment has proved very beneficial. Should these simple methods fail, the possibility of a surgical operation must be considered. The unduly movable organs can be fixed to the back wall of the abdominal cavity. These operations are not always successful, however, and any relief which is afforded may not be permanent. (*See also* ABDOMEN; BELT; INTESTINE.)

VISION.—Vision is a function of the brain; the eye is the instrument by which we see. When the image of an external object is formed on the retina, a nerve current passes through the optic ("eye") nerve to the brain, and stimulates the cells in the two vision centres, which lie at the back of the brain.

There is not one centre for each eye, but each shares in both. For example, if one centre were destroyed, half of each retina would lose the faculty of sight, and we should be blind on one or the other side.

Vision includes also the formation of judgments of seen objects, which judgments are based on experience, and can be increased by practice, as in the detective, medical, and artistic professions. Visual illusions, however, are quite common, e.g. the stationary moon seen through flying clouds seems to our eyes to move.

The visual centre on the left side appears to store visual memories. If, for instance, the centre for "visual speech" were destroyed, we should be able to see words, but not to read. If complete destruction took place, we should still *see* objects, but should only be able to *recognize* them by handling them.

Infants under six months cannot see clearly because they have not learnt to focus accurately, and cannot keep a moving object in view. Even after they can focus easily, and move head and eyes quickly, they are very apt to make mistakes in visual judgment, and naturally try to correct their mistakes by using their other senses. An infant "puts everything into his mouth" not because he is hungry or greedy, but because he is inquisitive. An older child handles everything he sees not because he is naughty but because he wants to find out all about it. As far as possible, children should be encouraged to examine a large variety of objects as a matter of educative training.

VITAL STATISTICS.—The statistics which deal with births, deaths, causes of deaths, and marriages, are described as vital statistics. They are of great importance from the point of view of public health and are a help to the solution of public health problems. (*See also* BIRTH-RATE; DEATH-RATE.)

VITAMINS.—These are substances present in various foodstuffs of a very complex composition which are essential for the maintenance of health. So far they have defeated the efforts of the chemist to create them in the laboratory, yet their existence is definite and should any of them be deficient in the dietary, serious disease results. There are six vitamins generally recognized, named from A to E, each with a specific function to perform in the maintenance of human nutrition. There are few articles of food which contain them all. Some foodstuffs are particularly rich in one while deficient in another; and, as all are essential for health, it is clear that a meal should be arranged so as to give a full complement of each vitamin. (*See also* DEFICIENCY DISEASES; SUPPLEMENT ON DIET.)

VITRIOL.—Another name for Sulphuric Acid.

VIVISECTION.—Any scientific experiments conducted on living animals are popularly described as vivisection, even though such experiments involve no actual cutting. Under the Cruelty to Animals Act of 1876, vivisection can only be carried out under licence granted by the Secretary of State, and the animal must be so anæsthetized that it experiences no pain. Laboratories where vivisection is carried out are subject to visits from inspectors without notice.

VOCAL CORDS.—These are two cords consisting of tense elastic bands which stretch from back to front of the larynx. Each is controlled by small muscles supplied by nerves under the control of the will. It is through the vibration of these cords that speech is chiefly produced. During swallowing, the vocal cords approximate and so prevent food from passing into the larynx on its way to the gullet. Above the "true" vocal cords are the false vocal cords, which are simply folds of tissue which take no part in phonation. (*See also* LARYNX.)

VOICE.—The mechanism of voice production and disorders of the voice are described under the heading of SPEECH.

VOLVULUS.—The twisting of a length of bowel upon itself so as to obstruct the passage of the bowel contents is called volvulus. The portion most usually affected is the sigmoid colon, and the affection is associated with chronic constipation. (*See also* INTESTINE: OBSTRUCTION.)

VOMER.—This is the small bone, shaped like a ploughshare, which takes part in the formation of the nasal septum or partition between the two nasal chambers. (*See also* NOSE.)

VOMITING.—The violent and forcible expulsion of the stomach contents through the mouth is called vomiting. This act is generally preceded and accompanied by a feeling of sickness or nausea and by a free flow of saliva. The mechanism of vomiting is fairly complex: first a deep breath is

taken and the opening to the larynx is closed; then the abdominal muscles contract quickly and force the stomach against the diaphragm; at the same time the upper opening of the stomach relaxes and the stomach contents are forced upwards. Actually, the contractions of the muscular walls of the stomach are insignificant in the production of vomiting.

The causes of vomiting are exceedingly numerous and many are not related to the digestive organs. The commonest cause, however, is irritation of the stomach from the eating of unsuitable foods, the drinking of excessive amounts of alcohol, or from the swallowing of irritant chemical poisons. Vomiting is a symptom of gastric catarrh, acute or chronic, and of other organic diseases of the stomach such as ulcer, cancer, and dilatation of that organ. In the case of gastric ulcer or cancer, vomiting usually takes place immediately after a meal and the vomit may be blood-stained. In dilatation of the stomach there is vomiting of large quantities of fluid at considerable intervals of time. After very severe vomiting from any cause, the vomit may be streaked with blood, and this is merely due to the effects of straining upon the membranes of the stomach. In cancer of the stomach, the vomit may be "coffee-ground" in appearance; this is due to the gastric secretion altering blood which has oozed from the cancer.

Vomiting may arise from reflex causes, i.e. from irritation in some distant organ. Thus it may arise from tickling of the throat, from coughing, in colic, appendicitis, worms in the intestines, gall-stones, gall-bladder inflammation, liver and pancreatic disorders, and strangulated hernias. It may also occur in nervous and mental disorders, in hysteria, migraine, locomotor ataxia, brain tumour and abscesses, concussion and compression of the brain and meningitis. Any disagreeable smells or unpleasant sights may invoke vomiting in sensitive persons. The motion of a boat at sea is a common cause of vomiting. In children, periodic attacks of vomiting may arise, cyclical vomiting, which is associated with a diminution of the alkalinity of the blood (acidosis). In the early months of pregnancy, sickness, sometimes amounting to actual vomiting, is a common symptom. Finally, vomiting can be caused by direct irritation of the vomiting centre in the brain through the action of an emetic drug such as apomorphine or from the circulation in the blood of the poisons of certain infectious fevers.

Varieties.—The nature of the vomit gives an indication of the cause of vomiting. The presence of blood suggests ulcer or cancer or liver disease. Undigested food indicates the presence of some irritant or suggests the vomiting is not related directly to the stomach disorder. The presence of a large amount of mucus is evidence of gastric catarrh, particularly when of alcoholic origin. Bile may indicate liver or gall-bladder disorder, and it may be present in migrainous vomits. In dilated stomach, the vomit is very copious in amount and has a frothy appearance and a yeasty smell. In obstruction of the bowel, the vomit is first of the stomach contents, then bilious in nature and finally fæcal. Fragments of worms and parasites may be found in the vomit and are a clear indication of the cause of the vomiting.

Treatment.—It should be remembered that vomiting is in itself merely a symptom, and it is the fundamental cause which requires treatment. If it is due to irritant foods or drinks, the vomiting will rid the stomach of the cause of the trouble, and in such cases the vomiting is to be encouraged. Plenty of warm water should be drunk as this helps to wash out the stomach and also relieves the distress and discomfort of the vomiting. In gastritis or gastric catarrh, regulation of the diet is all important. For some days the diet should be limited to fluids, milk, egg and albumen water and, when all vomiting has ceased, semi-solid foods can then be taken. Distressing vomiting from any cause may be relieved by sipping hot water or iced soda water, or by the application of a mustard plaster to the abdomen. In children who suffer from cyclical vomiting, large doses of alkali (sodium bicarbonate) and of glucose will cut short the attacks. Alcoholic cases will benefit by a saline purge every morning. A great many drugs are used in the treatment of vomiting, tincture of opium, chloretone, dilute hydrocyanic acid, and others; but an effective remedy is to use a drop of tincture of iodine in a tablespoonful of tepid water and repeat the dose four or five times at fifteen-minute intervals. (*See also* DYSPEPSIA; EMETIC; GASTRITIS; SEA SICKNESS.)

VULVA.—This is the name given to the external genital organs of the female. They consist of two pairs of lips or double folds of skin which surround and conceal the vaginal opening. These lips are called the labia majora and the labia minora. The front ends of the labia minora surround the clitoris, which is a sensitive erectile structure similar to the penis in the male sex.

Inflammation of the vulva, or vulvitis, may arise from lack of cleanliness of the parts or from the irritation of threadworms (especially in the case of children), but is commonly caused by gonorrhœa. The symptoms include a feeling of itching and burning with intense discomfort and the presence of a purulent discharge. The vulva become red and swollen. Treatment necessitates rest in bed with frequent bathing and douching, with the use of a mild antiseptic ointment. Gonorrhœal vulvitis requires special treatment under the direction of a doctor. (*See also* GENITAL SYSTEM.)

WARBURG'S TINCTURE.—This is a remedy invented by an Austrian physician during the nineteenth century and used in the treatment of the feverish stages of malaria. It contains a large number of ingredients, including quinine, rhubarb, camphor, aloes, opium and aromatic drugs, and it has a powerful stimulating effect upon the skin and helps to reduce fever.

WARTS.—Warts are small harmless tumours of the skin. They may appear on any part, and are thought to be due to an infection. They are certainly contagious. There are four varieties: (1) the common raised wart found on the hands; (2) the flat wart found on the hands and face, and most commonly in children; (3) the corn-like warts found on the soles, rarely on the palms, at sites of pressure; (4) "cauliflower" or venereal warts, found chiefly about the genitals and anus. Warts may also occur on a skin affected with seborrhœa, and on a senile skin. These may become cancerous.

Treatment.—The simplest method is to freeze the warts with ethyl chloride and snip them off with scissors; or they may be destroyed by freezing with carbon dioxide snow. Caustic, such as salicylic or acetic acids, are efficient but slow, and the pain naturally lasts over a longer period. Venereal warts owe their size to the heat and moisture of the parts, and when treated with a simple drying powder containing 5 per cent. salicylic acid readily shrivel up. Seborrhœic and senile warts are treated by curetting and cauterizing. Accompanying seborrhœa, and the itching so often found with senile warts, are treated under their individual headings.

The effect of X-rays on warts is, in careful hands, remarkable, large crops often disappearing in a very short time. On the other hand, in some cases this treatment may fail entirely.

Internally, arsenic in small doses, Epsom salts, or green iodide of mercury will sometimes produce a cure; and the injection of salvarsan (an arsenical preparation) is successful in some cases.

WASH.—This is simply another name for a lotion, the term being retained in connexion with certain old preparations. Thus red wash is a lotion of zinc sulphate with tincture of lavender; black wash is a lotion of calomel and lime water.

WASP STING.—*See* BITES AND STINGS.

WASSERMANN REACTION.—This is a test introduced by Wassermann in 1906 for the detection of syphilitic infection. It is a very complicated reaction and requires to be carried out by a skilled pathologist. The test can be applied to the blood or to the cerebro-spinal fluid. It is exceedingly valuable as an aid to diagnosis and also as a means of controlling treatment. The Wassermann reaction is also given by certain tropical diseases, yaws, trypanosomiasis, and occasionally leprosy, but with these exceptions a positive test is conclusive evidence of syphilitic disease. (*See also* SYPHILIS.)

WASTING.—*See* ATROPHY; EMACIATION; MARASMUS.

WASTING PALSY.—*See* PROGRESSIVE MUSCULAR ATROPHY.

WATER.—Chemically, water is a combination of hydrogen and oxygen. Water is as essential as food to the living organism.

Two thirds of the weight of the human body consists of water, a proportion which must be kept constant, and since the body is continually losing water at the rate of five or six pints a day, the loss must be made good by at least as much taken in the form of fluid or water-containing food.

The channels by which water escapes from the body are the skin, kidneys, lungs and bowels, and, as water is essential to enable these organs to carry out their work as waste eliminators, the need for drinking ample amounts of water is obvious if good health is to be maintained. If the waste products are too concentrated from lack of water in the body, they injure the delicate cells of the kidneys; also, waste from the bowel is more difficult to evacuate if water is not available and constipation is inevitable.

Hard and Soft Waters.—Hardness is classified as temporary or permanent according as it is removed or not by boiling. Actually it depends upon the salts present. If they are in the form of bicarbonates, the boiling causes their precipitation as carbonates. It is these salts which constitute the fur which develops in kettles and boilers. Permanent hardness is caused by salts of lime and magnesium other than the carbonates and by iron and alum. Hard water is wasteful from the domestic point of view as it leads to destruction of soap and to the furring of pipes and cisterns.

Soft waters contain mineral salts in very small proportions. There is some danger with very soft waters, especially those derived from peaty soils, because of their solvent action on the lead used in the construction of pipes and cisterns. This may lead to lead poisoning. To correct this effect, lime or soda is added to the water in fixed quantity. From the standpoint of health, hard waters may be harmful to some people. They may cause diarrhœa or constipation and dyspepsia, while sensitive skins are irritated by them. The presence of iron may lead to headaches, and calculi (stones) in different organs may be related to the drinking of excessively hard water. A hard water may be softened by boiling, but on a large scale slaked lime in quantities dependent upon the degree of hardness is used. To correct permanent hardness soda must be added. Special domestic water-softeners are now on the market and lead to considerable saving in soap and in the preservation of pipes, etc.

Water and Disease.—Water is a ready medium for the spread of certain types of disease. Ordinary organic pollution may cause diarrhœa, but the greatest danger lies in water which has been contaminated with disease germs capable of surviving in the water for prolonged periods. Sewage pollution of water may cause its infection with the germs of typhoid, paratyphoid, cholera, and dysentery, while certain worms and their eggs may exist in water and cause infection in human beings. The most efficient method of removing germ impurities from water is by boiling, but this is inapplicable on a large scale. Therefore, it becomes necessary to adopt some method of filtration. The usual type of filter is one containing a 2 foot layer of sharp sand supported upon a bed of gravel and stones which increase in size till the bottom of the filter, where the outlet pipe is situated, is reached. As a preliminary to filtration, storage of water is practised in special reservoirs for about 30 days as this greatly reduces the number of germs present.

Mechanical filters are often used for domestic purposes, some of these combining a means of chemical purification. The best domestic filters are those made of mixtures of porcelain and clay and moulded into candles, the water being forced through them by pressure. They require to be kept clean by regular washing and boiling. The Pasteur-Chamberland and the Berkfeld are the best-known filters of this class.

Chemical substances can completely purify water and are often used in some places, or more often in an emergency as during a military campaign. The great objection to this method is that large quantities of germicide must be added and this may constitute a danger to health and in any case the water is rendered unpalatable to the taste. One of the commonest agents for this purpose is chlorinated lime or bleaching powder. This sets free chlorine which is destructive to germ life. A stock solution of this re-agent may be made by adding half-a-teaspoonful of the powder to a pint of cold water; a teaspoonful of this solution is added to ten gallons of water and in half-an-hour the water can be reckoned safe for drinking. The unpleasant taste of the chloride can be

got rid of by adding sodium hyposulphate. Both preparations can now be had in tablet form for treating water of doubtful purity.

Potassium permanganate is often used for chemical purification. It oxidizes organic vegetable matter and kills germs. Sufficient permanganate is added to turn the water a very pale pink and the water is allowed to stand for half an hour. Acid sodium sulphate, used in a strength of 15 grains to the quart and allowed to act for 15 minutes, is also an effective purifier and tablets of this chemical are available for this purpose. Electrically produced ozone has been utilized for water sterilization, but this is an expensive method though the results are good. Similarly, ultra-violet rays have been used for the same purpose.

It is impossible to judge from the appearance, clearness and taste of a water whether it is fit for consumption. A water that is clear and sparkling may be highly dangerous. Therefore the source of the water should always be considered and precautions adopted accordingly.

A household supply of water may be drawn direct from the main or may be received into a cistern. This should be constructed of galvanized iron, properly covered and accessible for cleaning purposes. It should be provided with an overflow pipe discharging in the open, and it should not connect directly with the stool of the w.c., but through the cistern.

WATER-BED.—A large rubber bag, formed like a mattress, and filled with water, is called a water-bed. It is valuable in the nursing of chronic bed patients who are liable to develop bed-sores. (*See also* NURSING.)

WATER-BRASH.—This is the regurgitation into the mouth of a hot, bitter fluid from the stomach. Very often it is accompanied by heartburn. Water-brash is a symptom of acid dyspepsia. (*See also* HEARTBURN.)

WATER-HAMMER PULSE.—In severe disease of the aortic valve of the heart, in which there is regurgitation of blood, the pulse has a characteristic up and down movement. There is a strong impulse at the pulse which falls away very rapidly. This thumping pulse is called the water-hammer or Corrigan's pulse. (*See also* HEART.)

WATER ON THE BRAIN.—*See* HYDROCEPHALUS.

WAX (Cerumen).—*See* EAR.

WAXY DISEASE.—*See* AMYLOID DISEASE.

WEANING.—*See* INFANT FEEDING.

WEBBED TOES.—If the toes are united by folds of skin, they are described as webbed. The condition is generally present from birth, being an inherited defect, and it may also be present in the fingers. In the case of the toes no treatment is necessary, but with the fingers the web is a definite handicap and requires to be removed surgically. Occasionally, webbing may be produced by a severe burn of the hand which has been neglected and allowed to go septic.

WEIGHT.—This is a useful indication of the general health of an individual, as there is some correspondence between weight and height and weight and age. (*See* tables under heading of OBESITY.) Naturally, weight varies with habits of diet and exercise, but thinness and stoutness are to a large extent constitutional. Some people are born to be thin and others to be fat. Progressive loss of weight—not definitely of dietetic origin, as from fasting—is evidence of constitutional disease, and is a symptom always to be regarded seriously. Diabetes, tuberculosis and cancer are important amongst the diseases which produce rapid and progressive loss of weight. (*See also* GROWTH.)

WEIGHTS AND MEASURES.—*See* APOTHECARIES' WEIGHTS AND MEASURES.

WEIL'S DISEASE.—This is a febrile disorder associated with jaundice and bleedings and occurring in epidemic form. It is comparatively rare in Great Britain, but was frequently observed in France during the Great War. The disease is caused by a spirochæte, a spiral germ, which is conveyed to man by the bites of insects or by the drinking of water contaminated by rats who may carry the germ. It may also be acquired by bathing in infected waters.

The onset of the disease is sudden and marked by headaches and shivering. About the fourth day jaundice sets in, and increases in severity till about the tenth day. Bleeding occurs from different parts of the body, from the nose, stomach, bowel, and lungs. The liver becomes enlarged and tender. Within a fortnight the temperature subsides and recovery gradually takes place. During the course of the disease, the spirochætes are found in the blood and in the urine.

Treatment.—The patient must be nursed in bed and kept on a fluid diet. The bowels

are freely purged, calomel in repeated small doses being given. A curative serum is available, and has been used with some success. (*See also* JAUNDICE.)

WEIR-MITCHELL TREATMENT.—This is a form of enforced rest cure, called after an American physician, adopted in the treatment of various neurotic illnesses. The essential features are isolation from all friends and relatives, complete rest in bed, a generous diet and massage.

The patient is sent to a nursing home, put to bed in a room alone, and only permitted to see doctor and nurse. No activity is permitted—no reading, sewing or knitting, and the patient is not allowed any communication with the outside world. Then, every effort is made to increase weight. At first, the patient is induced to eat a little more than is the custom. Milk is given with all meals, which becomes progressively larger until four good nutritious meals are taken daily as well as 3 to 4 pints of milk and 12 to 15 ounces of cream. General massage is commenced, with 20 minute periods increasing to an hour every morning, and by the second fortnight, twice daily.



Wen or Sebaceous Cyst

This rigorous regime is continued for a month and, as recovery becomes established, the patient is gradually allowed to return to a more or less normal life. A holiday before returning home is generally advisable. The success of the Weir-Mitchell treatment largely depends upon the absolute completeness with which it is carried out.

WEN.—This is the popular term for a sebaceous cyst. It forms in the skin, most often of the scalp, face or back, and results from the blocking of a duct of a sebaceous gland. Normally, the oily secretion of these glands is poured out on the skin, but should the duct of the gland be obstructed from any cause, the secretion accumulates and a soft swelling forms which gradually enlarges to considerable dimensions if untreated. The skin over the wen in time becomes thin and red and may become inflamed if irritated. Suppuration may then arise, and the wen ruptures with the discharge of offensive pus. Apart from this complication, wens are disfiguring, and they should be removed when of quite moderate size. The operation is very simple and is carried out under a local anæsthetic. It consists of opening the cyst, evacuating its contents, and then removing the whole of the cyst wall.

WHEY.—This is the watery fluid which remains when the clot formed in milk by the action of the ferment, rennet, is removed. It contains sugar, proteins, salts and fats in small quantities and also vitamins A and B. Though of comparatively slight nutritive value, it is sometimes used in conjunction with fruit and vegetables to form a dietetic regime called the whey cure. It is recommended in some forms of dyspepsia, especially if due to over-feeding and in chronic bronchial catarrh. Whey is also a useful food drink in certain fevers and in kidney disease, especially if whole milk cannot be tolerated. Wine whey is a pleasant drink for convalescents. It is made by adding half a glass of sherry to a teacupful of milk in a saucepan and heating till clotting has occurred. The milk is then strained and the whey sweetened with sugar if desired.

WHIPWORM.—*See* WORM.

WHITE LEG.—This is the popular expression used to describe a swelling of the leg which sometimes complicates the puerperium, i.e., the first 2 or 3 weeks after childbirth. The condition is due to an inflammation of the lymph vessels of the leg which partially obstructs the channels and leads to a white swelling of the limb. The infection probably enters the lymphatic system through injury of the tissues at the neck of the womb. Most often the left leg is involved.

The swelling is first noticed in the thigh and gradually extends to the whole leg. It is dead white in colour and the swelling is hard and unyielding. There is usually a certain amount of fever which persists for a few days. Treatment necessitates absolute

rest in bed with elevation of the limb by means of pillows. Pain is relieved by a glycerine and belladonna mixture applied locally, and the bowels are kept freely open. Within a few weeks, the condition subsides and recovery is complete although in a few cases the swelling of the leg may reappear on exertion. Massage is useful in such cases. Swelling of the lower limbs may also arise from clotting of the blood in deep veins during the course of infective fevers such as typhoid or pneumonia. (*See also* LYMPHATIC SYSTEM; PHLEBITIS; THROMBOSIS.)

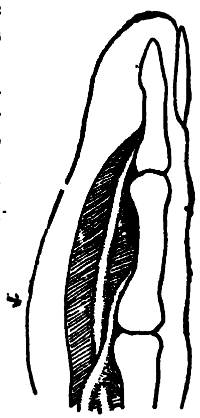
WHITES.—The name "whites" is popularly used for a thick white or yellow vaginal discharge due to an unhealthy condition of the vagina. It is described under its medical name of LEUCORRHŒA.

WHITLOW.—This is a painful septic inflammation occurring usually in one of the fingers or thumb. It is most often caused by the prick of a dirty pin or some such sharp object. The inflammation may only extend under the scarf skin when it is described as subcuticular; or it may involve the tissue under the skin, the subcutaneous variety; or the sheath of a tendon may be affected, the thecal type; or the infection may be subperiosteal when it attacks the periosteum or covering of the bone. A deep whitlow, involving a tendon or bone, may arise from a superficial infection passing deeply or by the initial injury going sufficiently far into the tissues.

A superficial whitlow commences as a red tender spot which becomes a blister filled with pus. If the inflammation spreads more deeply, pain and tenderness become very marked, and there is also throbbing. The whole finger commences to swell, the glands in the elbow and armpit become tender and the pain gets progressively worse in the finger and may be so severe as to prevent sleep. There is often a certain amount of fever and constitutional disturbance according to the degree of the inflammation.

The thecal form is most dangerous. Suppuration in a tendon sheath may extend into the palm, and this is almost certain to cause subsequent disability in the use of the hand. If the tendon of the thumb or little finger is involved, the inflammation may spread to the wrist and forearm and abscess formation may take place. In the most severe cases there may be sloughing of the tendons and the bone may be affected, causing its destruction. In such a case, it may become necessary to sacrifice the hand by amputation to prevent further spread of the suppuration, and there is always a danger of a serious blood infection or septicæmia arising as a further complication and not infrequently proving fatal.

It is therefore clear that a whitlow is a potentially dangerous condition and should always be regarded seriously. If the whitlow does not immediately respond to home methods of treatment, there should be no delay in seeking expert treatment from the doctor. It is nearly always in cases where the sufferer has continued to attempt self-treatment that the grave complications mentioned arise.


Whitlow

With a superficial whitlow, the best immediate treatment is to open the blister with a sterile needle or pair of scissors, allow the contents to escape, remove any loose skin, and then apply a boracic fomentation and continue fomenting until all pain and redness disappear. Deeper types of whitlow require free incision deeply into the skin in order to allow any pus to drain away. This should be performed by the doctor. Subsequently hot boracic fomentations are applied at frequent intervals until the condition clears up. Meanwhile the arm should be supported by a sling with the hand well raised. (*See also* ABSCESS.)

WHOOPING COUGH.—An acute infectious fever characterized by peculiar spasmodic outbursts of coughing; whooping cough is also known by the technical term pertussis. It is an epidemic disease, occurring in childhood and generally before the age of ten. Whooping cough is caused by a germ called the bacillus of Bordet and Gengou and it is found in the sputum and nose discharges of sufferers. Infection is conveyed by droplets of discharged fluid laden with germs, but the risks of infection diminish after the early stages of the fever are past, and, during the spasmodic coughing stage, the danger

of transmitting the disease is slight. One attack of the disease confers complete immunity for the rest of life.

The incubation period is from one to two weeks and the fever is conveniently divided into three stages. Firstly, lasting from 7 to 10 days there are symptoms suggesting a severe cold in the head with a certain amount of feverishness. There is some degree of bronchitis with a hard cough, and then in the second stage there develops the typical spasmodic cough. This consists of a series of short expiratory coughs without any air entering the lungs, the sufferer becoming black in the face at times. Then follows a long crowing expiration, producing the characteristic "whoop." A number of attacks usually follow on each other and, as a rule, relief does not arise until either vomiting occurs, or a considerable quantity of sticky mucus secretion is brought up. The paroxysms most often come on at night-time before sleeping, and sometimes after meals. They are liable to be induced by a fright or by hearing someone else cough.

During the attacks the eyes bulge and may become bloodshot and bleeding may occur into the conjunctiva. The child holds on to the bed or an adult and is in great fear. Bleeding from the nose not infrequently arises, and very occasionally bleeding into the brain may result. Convulsions may also be induced in very young children. Interference with the child's sleep and the inability to take proper nourishment and the vomiting may produce considerable exhaustion and wasting.

In the third stage, the whooping cough gets gradually less and within three or four weeks the child should be practically well. In some debilitated children an occasional whoop may persist for some months. The complication most to be feared in whooping cough is catarrhal pneumonia, and for the prevention of this everything depends upon careful nursing and treatment of the child. Persistent bronchitis and emphysema may also be sequels to severe attacks. There is also a danger that the weakened resources of the child may render it a prey to tubercular infection. As whooping cough is very infectious in the early stages, complete isolation of the child is essential in the interests of other children. Six weeks is generally reckoned as an adequate time; and children who have been in contact with a known case of the disease should be isolated for three weeks as a precautionary measure. During an epidemic of whooping cough, a child who develops an acute cold in the head with bronchitis should be carefully watched and preferably isolated until the real nature of the illness is manifest.

Treatment.—In the case of strong children there may be no need to put them to bed, especially in the summer. They should have as much fresh air as possible and should be kept warm and given nutritious food. With more delicate children—and in winter—they should be kept in bed exclusively in one room until the temperature has subsided and the symptoms have considerably abated. The air of the room may be impregnated with cresoline or similar drugs. If there is much vomiting, the diet should be restricted to milk, beaten eggs and custard. Gentle massaging of the chest with camphorated oil, and an occasional linseed poultice may diminish the number and intensity of the attacks and the child should always be kept free from excitement. Drugs such as bromide and chloral may be prescribed to control the paroxysms, and there is now available a vaccine which is preventive in the earliest stages and mitigates the disease if it develops. During a paroxysm, someone should always be present to comfort and reassure the child, as the mental strain to a young child so induced is very great. Care should be taken to disinfect and destroy any sputum from the child, especially in the early stages. (*See also* BRONCHO-PNEUMONIA; DISINFECTION; INFECTIOUS DISEASE.)

WIDAL TEST.—This is a bacteriological test used in the diagnosis of typhoid fever. It depends upon the power of the patient's blood serum to agglutinate or clump together typhoid bacilli, and it is present from about the fifth day of the disease. (*See also* AGGLUTINATION.)

WIND.—*See* FLATULENCE.

WINDPIPE.—The windpipe is described under its medical name of TRACHEA.

WINTER COUGH.—A winter cough is usually BRONCHITIS and is described under that name.

WINTERGREEN.—*See* GAULTHERIA.

WITCH HAZEL.—The hamamelis virginiana, or witch hazel, is a shrub which grows in North America, and from its bark

and leaves are obtained tannic acid and a volatile oil. The tincture of hamamelis is made from the bark and the liquid extract from the leaves. Owing to its astringent properties the extract is commonly used in the treatment of bruises and sprains, while the tincture is sometimes used to stop bleeding from the nose and gums, and, in ointment form, witch hazel is a popular remedy for bleeding piles.

WOMB.—The uterus, or womb, is a pear-shaped organ freely movable in the pelvis and situated between the bladder and the rectum. It measures 3½ inches long, 2 inches wide by 1 inch thick; its narrow end or neck projects into the vagina, while its upper expanded end, or fundus, has the Fallopian tubes springing from its sides. These pass outwards to be loosely attached to the ovaries and they convey microscopic ova (eggs) from the ovaries to the womb.

The womb consists of an outer or serous coat, a middle or muscular coat, and an inner or mucous coat. The mucous membrane is of peculiar structure and is constantly undergoing changes. During the child-bearing period it periodically becomes engorged with blood, culminating in menstruation. The membrane is reconstructed every month unless pregnancy takes place, when it undergoes another complete change. After birth, it slowly returns to its normal condition and remains quiescent until lactation has ceased.

Owing to its movability, the womb is constantly being affected by its neighbouring organs, especially the bladder, the varying size of which necessitates accommodating movements of the womb. In close association with the Fallopian tubes are two muscular cords, the round ligaments, which extend upwards and pass to the external genital organs (labia majora) and help to support the womb. There are six other supporting ligaments which are composed of folds of peritoneum, the lining membrane of the abdominal cavity. Inside the uterus there is a triangular cavity into which the Fallopian tubes open above, and which is prolonged downwards into the cavity of the neck of the womb as the cervical canal. This opens into the vagina, the opening being termed the external os (to distinguish it from the internal os), which is the place where the cervical canal joins the cavity of the body of the womb.

Displacement of the Womb.—Normally the womb is bent forwards upon itself at the junction of the neck with the body, this position being described as *anteflexion*. It is also bent forward in the pelvic cavity and this is termed *anteversion*. When it is bent backwards this is called *retroflexion*, and when it is tilted right back on itself this is called *retroversion*. One of the commonest forms of womb trouble is one or other of the displacements to which the organ is subject. It may be displaced in various directions by pressure exerted by tumours or swellings in the abdomen, or by adhesions to other organs which drag upon it, or by its own weight, especially if there is a co-existing weakness of the supporting ligaments and muscular floor of the pelvis.

Prolapse, or "falling of the womb," is a downwards displacement. It is most common in elderly women whose muscles have lost tone or who have become thinner, and so have lost the support of the internal pads of fat which help to maintain the womb in position. It may also arise following a confinement in which the birth passages have been injured and torn and the tissues have not firmed up adequately. Frequent straining as a result of chronic constipation or a chronic cough, also tends to downward displacement especially if there is any weakness of the ligaments and the pelvic floor.

The first symptom is generally a feeling of inward heaviness, with backache and a sensation of always being tired. There is also frequent desire to pass water and to empty the bowels, while menstruation is often excessive and more prolonged than usual. At this stage the patient should consult a doctor, for much can be done by exercises, general tonic treatment, fresh air, correct dieting and the relief of constipation to prevent further trouble and avoid the need for an operation. Once a displacement is definitely established a pessary or womb support will be required or an operation resorted to. In an otherwise healthy woman the latter is preferable, as a pessary is only palliative, and unless correctly fitted is of no value. In very severe cases, the womb may appear outside the body and then it is apt to become ulcerated and bleed. Part of the bladder and bowel may also protrude (cystocele and recticele) and cause discomfort. In such cases an operation is desirable.

Rarely, after childbirth, a form of displacement arises in which the womb turns inside out. This is a very grave emergency and necessitates immediate surgical treatmen. Quite a number of displacements of the womb cause no apparent disturbance of health and are only discovered accidentally. Therefore, a woman need not be anxious if she is informed that her womb is displaced, provided there are no symptoms. An excessive degree of anteflexion, i.e. exaggeration of the normal position of the womb, may lead to irritability of the bladder and is often associated with painful menstruation. It may lead to sterility, and in some cases, should conception occur, abortion about the third or fourth month may result.

Tumours of the Womb.—In the womb the commonest simple tumour is the fibroid or fibro-myoma. It is a solid tumour consisting of a mixture of fibrous, muscular and sometimes glandular tissue. The growth may occur at any time of life; but it is rare before the age of thirty, and is most frequent about the change of life. It occurs most commonly in childless or unmarried women. In size, a fibroid varies from that of a small marble to that of a child's head, and it may be situated under the peritoneum lining of the womb, in the wall of the womb, or may bulge into the cavity of the womb.

If situated on the inner surface, bleeding is a common symptom and may be severe. Such a fibroid is apt to become stalked or pedunculated. It gives rise to pain at the menstrual period, and there is often leucorrhœa. A small fibroid in the wall of the womb may give rise to no symptoms, but as it tends to increase in size it may cause adverse effects through pressure. Fibroid tumours in the womb are often multiple and may grow to an enormous size—shown by considerable abdominal swelling. Such a swelling may be mistaken for pregnancy.

Fibroid tumours may occasionally disappear spontaneously, after a pregnancy or at the menopause, but generally it is advisable to have them removed by surgical operation, as there is always a danger of their undergoing a malignant degeneration. The presence of symptoms from pressure, or the occurrence of bleeding are definite indications for operation and there should be no delay. In some cases, X-ray or radium may be used to control the growth, but this treatment is apt to hasten the onset of the change of life. In a comparatively young woman, a fibroid should always be removed, as, should pregnancy occur, there may be danger to the mother and child. (*See also* FIBROID.)

Malignant growth or cancer of the womb is of fairly frequent occurrence, and generally arises in women who have borne children. It is most commonly situated at the cervix or neck of the womb, and it is apt to spread locally and also to set up secondary growths in other parts of the body. The early symptoms are important. Bleeding at irregular intervals after the menopause, and an unpleasant discharge are the first signs. Pain is a late symptom. In such cases, a doctor should immediately be consulted for in the early stages much can be done to cure the condition. Cancer treated early is often curable, but when not detected till well advanced it is one of the deadliest of all diseases. A surgical operation along with radium treatment give the best chances for cure. The sarcoma, another malignant growth, may also occur in the womb, sometimes in young girls. The outlook in such a case is unfavourable. Yet another malignant tumour, fortunately comparatively rare, is the chorion epithelioma. It is an overgrowth of the villi, finger-like projections of the chorion, which is one of the membranes surrounding the embryo within the womb.

Inflammation of the womb mucous membrane is termed endometritis, of the muscle—metritis, and of the tissues surrounding the womb—perimetritis. It is treated usually by hot douches; but an operation (curettage) may sometimes be necessary. (*See also* GENITAL SYSTEM; MENSTRUATION; PESSARY; VISCEROPTOSIS.)

WOOLSORTER'S DISEASE.—*See* ANTHRAX.

WORD BLINDNESS.—Inability to understand written language. It occurs in some forms of aphasia, and is due to damage to that part of the brain which controls written or "seeing" speech. If a written request be handed to a patient who suffers from word-blindness such as "Put out your tongue," or "Hold out your hand," he is unable to understand it; but if the same request be made by the voice, he will obey it, showing that sounds have a meaning for him to which he can respond, although

written letters have lost their meaning. (*See also* APHASIA.)

WORM.—Various types of worm are parasitic in the human body and are productive of disease. There are two main groups, the flatworms which consist of the tapeworms and flukes, and the roundworms. These parasites gain entrance to the body through the eating of infected food, drinking infected water or directly through the skin.

The roundworms most often infecting man are the thread or pinworm, the ascaris lumbricoides—or intestinal roundworm, and the whipworm or tricocepalus dispar. There is one other variety, the ankylostoma, but this worm is rarely met with in this country. The *ascaris lumbricoides* resembles the ordinary earthworm; it has a pinkish colour, tapers at each end, and the mouth is surrounded by three projections armed with fine teeth. In length it varies from 4 to 12 inches. It is probable that the mouse or rat is the intermediate host by swallowing the eggs. These develop into larvæ and are deposited on human food, and the infection so conveyed to man. The worms live in the small intestine and may make their way into the bile ducts, stomach, gullet and thence to the air passages. They are expelled by the bowel or they may be vomited. As a rule only two or three worms are present, but occasionally there are large numbers.

If only a few are present, there may be no symptoms and the condition is only discovered when a worm is detected in the motion. On the other hand, there may be a capricious appetite, with itching of the nose, sickness and vomiting, and sometimes blood in the motions. In children convulsions may arise. If a worm enters the bile duct, jaundice may be caused and, if a large number of worms are present, they may lead to obstruction of the bowel. The best treatment is the correct administration of the drug santonin or oil of chenopodium. A light diet precedes the use of the former drug, which is given in doses from 1 to 5 grains along with 2 grains of calomel at bed-time. In the morning a saline purge is taken. Santonin must be administered with care as it sometimes upsets the patient, producing yellow vision amongst other unpleasant symptoms, and two nights should elapse before the dose is repeated.

The **threadworm** or *oxyuris vermicularis* is an exceedingly common infection in children. This worm is about ¼- to ¾-inch in length, the female being 2 to 3 times larger than the male. The worm gets into the body by the swallowing of the eggs which hatch out in the intestine where the worms mature. Their habitat is the large intestine from the cæcum to the anus, and the impregnated female discharges her eggs in the rectum, from which they are voided in the stools.

The worms often wriggle out of the anus, causing intense itching, especially at night. In females they may enter the vagina, causing irritation and discharge. Children are apt to scratch these parts and convey the eggs to the mouth and so infect themselves. Children so infected are peevish, irritable, complain of colicky pain and exhibit reflex symptoms such as grinding of the teeth at night, night terrors, and occasionally convulsions. The appetite may be voracious. The condition is easily detected by finding the worms in the motions. They resemble small wriggling pieces of white thread.

To rid the bowel of the worms, frequent enemata of infusions of quassia are necessary. The young child should be given an injection into the bowel of about 6 ounces and older children up to ¾-pint. Salt and water or lime water are also used for this purpose, but are not so effective as infusion of quassia. Internally, small doses of santonin are beneficial, but this drug should be given only under medical supervision. On rising in the morning the child's anus should be washed after the bowels move, and a weak mercurial ointment applied fairly liberally to the part. Regular action of the bowels is essential, and if the child scratches at night a close pair of knickers should be worn. Every precaution should be taken to prevent the child re-infecting itself.

The **whipworm** or **tricocephalus dispar** is a very common parasite in man. It is especially prevalent in warm countries and infects man and monkeys. The whipworm measures about 2 inches in length, the female being slightly larger. It owes its name to the fact that it has a head and a slender neck with a thick body, thus resembling a minute whip. Its home is the cæcum, the first part of the larger bowel, but it wanders about the large intestine and may reside in the

appendix. It attaches itself to the mucous membrane by its head, the rest of the worm being free. The whipworm is believed to be a cause of appendicitis, and it may give rise to peritonitis by piercing the bowel wall. The symptoms are very variable; often there are none at all. Its presence may only be known by the discovery of its eggs in the motions. The whipworm is very difficult to expel, but oil of chenopodium is the best remedy. Infection usually arises from drinking contaminated water, so that any questionable water should always be boiled.

The **ankylostoma** is a small round worm armed with hooks, and the disease produced by infection is sometimes called hookworm disease or tunnel disease, for it was so prevalent amongst workers during the construction of certain tunnels, notably the St. Gothard in Switzerland. The worm finds entry in the larval state, and an eruption appears on the hands and arms—the so-called "ground itch." The most important symptoms are a profound anæmia with diarrhœa and great debility. Treatment is by administration of thymol taken on an empty stomach and followed by a purge. The anæmia also requires special treatment.

There are three varieties of **tapeworm,** known technically as the tænia solium, tænia saginata, and bothriocephalus latus. Common to all are a head and neck called the scolex, and a segmented body. The terminal segments contain the testes and uterus, and the latter is full of eggs which are evacuated. The total length of the tapeworm is anything up to 30 feet. It depends for its nourishment upon digested foods which are absorbed into its tissues from its host. Periodically, some of the segments pass out of the bowel, the eggs are set free, and for their further development they require to be swallowed by an animal.

The **tænia solum** or pork tapeworm is a flat ribbon-shaped worm, 8 to 15 feet in length, with a head the size of a pin-head with two rows of hooklets and four sucking discs. Each segment possesses the reproductive organs of both sexes. It is the pig which swallows the fertilized eggs, usually by eating contaminated vegetables. In the pig's stomach the shell of the egg is dissolved by the gastric juice and the embryo, armed with six hooks, bores its way into the stomach blood-veins and so makes its way to the liver, muscles or other organs. Here. it develops a small sac about the size of a pea, in which the hooklets are discarded and a head develops similar to that of the adult worm. The worm at this stage is described as a cysticercus. If the cysts are in the pig's flesh, the pork is said to be "measly," and consumption of such pork if inadequately cooked causes infection in man.

The **tænia saginata** has a larger head than the former, and it has four sucking disks but no hooklets. The intermediate host is the ox, and eating infected meat leads to the further development of the parasite in the human body.

The **bothriocephalus latus** is 20 to 30 feet long and has a long head with a sucking grove on either side. The larval form is found in fresh water fish—pike, salmon, perch and trout.

In all forms of tapeworm, when infected meat is eaten, the cyst is dissolved in the stomach, the head is set free and fixes itself to the mucous membrane of the intestine and develops segments. The symptoms are variable and the infection may only be discovered by finding segments of worms in the expelled motions. Colic may be complained of or the appetite may be unusual. Occasionally, there is headache, depression and irritability, these nervous symptoms being due to poisons liberated by the worm. Tapeworms may live for years in the human body, and there may be several present at the same time.

Treatment.—The most usual remedy is oil of male fern. This is administered with some carminative such as peppermint or cinnamon first thing in the morning before breakfast and after a fast which has commenced at 6 p.m. the night before. Two hours afterwards a saline purge is taken, or four hours later a dose of castor oil, and the motions are passed into warm water. It is essential that the head be sought for, otherwise, unless it be passed, the segments will grow again. Should the head not be passed, it will be three months before more segments are passed, and it is therefore advisable to wait until that time before recommencing treatment. *It is important* that the castor-oil should never be taken at the same time as the male fern, as it dissolves a harmful substance in the latter. Other remedies used

to kill tapeworm are oil of turpentine, and decoction of pomegranate bark.

There is a variety of tapeworm, **tænia echinococcus,** which exists in its adult stage in the dog or cat, but may be present in its immature larval form in man. It gives rise to what is called hydatid disease. The infection is rare in this country, but occurs in parts of the world where dogs and men live in very close contact. Hydatid cysts form in various organs of the body, lung, kidney, brain, and notably the liver. Symptoms are produced through pressure. The disease is very difficult to cure, a surgical operation usually being necessary.

The only flukeworm which is common in man is the bilharzia hæmatobia, or distomum hæmatobium, and it causes the disease bilharziasis. It is common in Egypt, India and Africa. Fresh water snails are the intermediate hosts, and infection results from the parasite entering the body through the skin or mucous membrane of the urethra as when bathing. The adult worms are found in the veins of the kidney and the ova, pierce the urinary mucous membrane and cause bleeding. Male fern is used in treatment, but it is impossible to destroy the adult worms in the veins.

The **trichina spiralis** is a round worm, the immature forms of which are found in the voluntary muscles of man. The adult worm is parasitic in rats, and is conveyed by these to pigs, in whose muscles they are deposited and encapsulated. Human beings derive the parasite from eating infected or trichinized pork, and the disease resulting is called trichinosis. When the diseased pork is eaten the capsules are digested in the stomach, and the worms thereupon mature and make their way to the muscles by the lymph channels, there to become capsulated. All the muscles may be affected, but most commonly the abdominal and intercostal muscles and the diaphragm.

When the embryos are boring the intestinal wall there is fever, abdominal pain, diarrhœa and sickness. In the muscles an inflammatory reaction takes place (myositis). There is local swelling, with pain on movement, and general stiffness. Breathlessness arises if the respiratory muscles are involved. The patient may be exceedingly ill, and not infrequently death results after a prolonged period of ill-health. The outlook depends upon the degree of early intestinal irritation, for diarrhœa favours the removal of the worms before they have time to mature.

Treatment for trichinosis is unsatisfactory. If there should be any suspicion that the food eaten is affected, an emetic should be given, followed by a dose of calomel to clear the digestive tract. Raising meat to the boiling point kills the encysted worms, and therefore it is smoked or imperfectly cooked meat which is dangerous and capable of spreading this disease. Inspection of meat has diminished the incidence of infection, but one infected carcase may lead to a local outbreak. (*See also* BILHARZIASIS; FILARIASIS; HYDATID DISEASE; MALE FERN; SANTONIN.)

WOUND.—Broadly speaking, a wound means any injury to the tissues of the body; but, in practice, it is generally confined to a breach of one of the surface tissues, an open injury involving a breaking of the skin. Open wounds are conveniently classified as incised, lacerated, punctured, and gun-shot. Further, they may be clean or poisoned.

An incised wound implies that the edges are not ragged and bruised. The wound gapes and there may be cutting of arteries and nerves if the injury is a deep one. Bleeding may be very free. Such wounds are obviously caused by sharp-cutting instruments, but may also arise if a hard blow catches the skin over a ridge of bone as in the case of the eyebrow. In these circumstances, there may be bruising of the tissue, the wound is then described as contused.

Treatment.—For a small incised wound this is simple. A little bleeding is beneficial, for it washes away dirt or germs. The wound should be touched with some cotton-wool or gauze soaked in tincture of iodine and a small piece of sterile white lint then applied and kept in position with a bandage. If bleeding is very free, the bandage should be tightly wound round the part for half an hour or so and then released and fixed more loosely. If the edges of the wound gape, a strip of adhesive plaster may be used to bring them together. Extensive incised wounds require to be stitched, and this is also advisable in the case of face wounds in order to minimize any subsequent disfigurement. If nerves or tendons are severed, it may be necessary to extend the wound in order to unite these structures. In incised wounds of the wrist, the possibility of cut nerves and tendons

has always to be borne in mind, otherwise, although the wound heals satisfactorily, the function of the hand may be seriously impaired.

In **lacerated wounds** the tissues are torn, and the edges of the wound are irregular and bruised. This is the type of wound liable to be caused by machinery, and it is more dangerous than an incised wound as it more readily goes septic owing to the devitalization of the surrounding tissues. Also, the resultant scar is apt to be unsightly. Bleeding may not be severe, as the coats of the arteries being torn, tend to curl up and block the vessel. Should, however, extensive bleeding arise, this must be attended to first. In the case of a limb, it should be elevated and the pressure spot for the main artery compressed. Meanwhile a tight bandage or improvised tourniquet should be applied to the limb. Tincture of iodine should be freely smeared over the surface and a sterile dressing then placed over the wound. If possible, stitching of the separated tissues will help to diminish unsightly scarring.

Punctured wounds are to be considered dangerous, as it is often impossible to tell the extent of the concealed injury, and also because infection may be conveyed deeply into the tissues. Such wounds are caused by stabbing instruments, needles, etc., or by thorns or splinters of wood. There is always the risk that an organ such as the lung or even the heart may be damaged, or the stomach or intestine perforated. In treatment, bleeding must be arrested and the wound covered. Then, the patient should be carefully watched, and if there is any doubt as to the depth of the wound, a doctor should be immediately summoned.

A gun-shot wound is one which is produced directly or indirectly by explosives. It may thus be a bullet, a fragment of a shell or masonry dislodged by an explosion. Such wounds are very varied. In the case of a bullet wound, there may only be a small hole at the point of entrance but considerable damage to deeper tissues and, if it penetrates right through, the point of exit may be large and lacerated. If the bullet is projected from a near range there may be some scorching or burning of the skin. The dangers of gun-shot wounds lie in the possible injury to vital structures and organs, such as arteries, nerves, lungs, heart or intestines, and in the likelihood of septic infection. The projectile very often traverses clothes and germs are introduced into the wound from this source. In the treatment of such wounds, it is generally advisable to remove the layer of tissue which surrounds the damaged area, in this way removing a possibly infected zone.

Wounds, from which all germs have been excluded, heal by what is called "first intention." The edges of the wound become glued together by blood serum and the cells of the adjoining tissues multiply and ultimately the wound is replaced by fibrous or scar tissue. If germs are present, however, the wound may suppurate and the process of healing is greatly delayed. Ultimately the germ infection is overcome and the tissues then heal by what is called "second intention." Poisoned wounds may be caused by bites from insects, such as wasps or mosquitoes, snakes or rabid animals. In such cases, the wound should be thoroughly cleaned with iodine or other antiseptic. In snake bite, crystals of permanganate of potash should be rubbed in and the limb encircled with a tourniquet for at least half an hour. In the case of a dog-bite, if there is any suspicion that the animal is rabid, the wound should be cauterized with pure carbolic.

Should there be any likelihood of *any* wound being contaminated with soil, especially manured soil, the patient should receive immediately an injection of *anti-tetanic serum* in order to prevent the possible development of tetanus or lockjaw. (*See also* ANTISEPTIC; BANDAGE; BITE; BLEEDING; FIRST AID SUPPLEMENT; IODINE; LOCKJAW; SHOCK; SEPTICÆMIA; TOURNIQUET.)

WRINKLES.—The skin is continually being stretched and relaxed by the movements of the body, and adapts itself by means of its natural elasticity. In course of time this elasticity diminishes, and the skin, being then too large for the body, forms folds or wrinkles.

It is obvious, therefore, that no "beauty treatment" for the cure of wrinkles will be of much use. Unskilled face massage, indeed, may produce the exact opposite to what was intended.

The only method of making a too-large skin smaller, and so (for a time, at least) removing wrinkles, is to take away strips of it by

surgical operation. (*See also* FACE-LIFTING and WRINKLES *under* BEAUTY CULTURE SUPPLEMENT.)

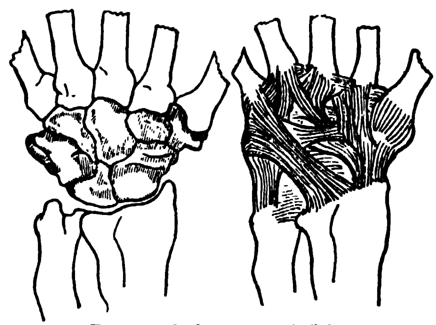
WRIST.—The region between the hand and the forearm is popularly described as the wrist. It may be conveniently taken as that part of the upper limb comprised by the lower ends of the radius and ulna, the eight carpal or wrist bones, and the adjacent parts of the metacarpal bones. The eight small bones are arranged in two rows of four, the upper four joining with the radius to form the radio-carpal joint, or the wrist joint proper. There is a considerable range of movement at the wrist, flexion (forward bending), extension (backward bending), adduction (bending to little finger side) and abduction (bending to thumb side). Forward and backward movements are also combined with side movements so that the wrist is exceedingly flexible. Consequently, dislocation is an infrequent injury, 'though sprains are comparatively common.

The wrist region is devoid of muscles, but there are numerous tendons by which the hand and fingers are moved and these strengthen the part considerably.

Fracture of the lower end of the radius, Colles' fracture, often results from a fall on the outstretched hand. A characteristic spoon-shaped deformity results. Reduction is, as a rule, easy if carried out immediately after the accident. It is important that a good result be obtained, otherwise the efficiency of the wrist joint may be seriously impaired. Fracture of one of the small wrist bones is difficult to detect, as there is little or no displacement, and an X-ray examination is necessary. Here again the main risk is that the tendons may be interfered with and a crippling fixation of the joint results. Therefore, as soon as the acute symptoms have abated, movements first passive and then active should be carried out at the joint to prevent adhesions.

Rheumatism, tuberculosis and gonorrhœal arthritis may involve the wrist. In all these diseases there is swelling, some pain, and restriction of movement. Rest for the part is necessary, a splint which cocks up the hand being advisable to prevent the powerful flexor muscles drawing down the hand and causing permanent disability.

In the condition of **wrist-drop**, the hand is flexed and cannot be raised owing to weakness or paralysis of the extensor muscles. This arises if the musculo-spiral nerve is injured from a penetrating wound or if it is inflamed from alcoholic, lead or arsenical poisoning. Wrist-drop may also arise in hemiplegia, the paralysis of one side of the body resulting from a cerebral hæmorrhage, or occasionally it may have an hysterical origin. In treatment, the hand, including the thumb, should be raised upon a splint, for in this way the extensor muscles are rested and the flexor muscles are prevented from drawing the wrist down. To keep the muscles healthy, massage should be practised at regular intervals. Where the nerve is inflamed, the source of the poisoning



Bones and Ligaments of Wrist

must be removed otherwise the condition will become permanent. (*See also* FOREARM; GANGLION; RADIUS; SPRAIN.)

WRITER'S CRAMP.—Also known as scrivener's palsy, this affection is of psychological rather than of physical origin and comes into the category of the occupational neuroses. Of similar nature are telegraphists', pianists', and typists' cramp. The condition shows itself by an inability properly to carry out the muscular movements entailed in writing, typing and so forth. There are cramps or spasms, with tremors, and frequently pain in the affected group of muscles. In time, the muscles may become wasted and the skin of the fingers glossy and thin.

Mental conflict is probably the root cause, the muscle cramps being evidence of the psychological tension and constituting a means of escape from difficult conditions of work. The treatment therefore must be mainly directed to this cause. A complete rest from all work is desirable, and if possible a change of environment. Tonic treatment and massage are beneficial, but every effort

must be made to investigate the sufferer's mind and discover the nature of the mental conflict. If this remains unsolved, any improvement is likely only to be temporary and a relapse occurs as soon as the person returns to work. It is a difficult condition to cure and not infrequently a change of occupation becomes necessary. (*See also* NEUROSIS.)

WRY NECK.—In this condition, the neck is bent to one side or the other. It is also termed torticollis and it occurs in two forms, either fixed or spasmodic. In the first variety, there is a shortening of the sterno-mastoid muscle, the muscle which turns the chin to the other side and bends the head sideways. It is generally inherited, though occasionally it may arise from injury at birth or later in life. Torticollis is not usually obvious in a baby, owing to the shortness of the neck but later it becomes quite evident. If manipulation of the neck is carried out in early life, or an apparatus is worn, the deformity may be cured, but if the condition is definitely established, an operation to divide the shortened muscle becomes necessary. As a result of wry neck, there is apt to develop a certain amount of wasting on one side of the face.

Wry neck occurring in adults is very often due to a rheumatic inflammation of the muscles. This condition is very painful, but it usually clears up rapidly under treatment with salicylates or aspirin along with counter irritation by the use of a liniment and massage. Wry neck may also arise reflexly from irritation in the teeth and from pressure from an inflamed gland in the neck. Spasmodic wry neck is frequently of hysterical origin and is seen mostly in women. It may develop ultimately into the fixed variety. Wry neck may also arise as a habit spasm in nervous children and adults. These varieties are exceedingly difficult to cure and their treatment is usually only possible by psychological investigation.

XANTHELASMA.—The term applied to the yellowish deposits which sometimes form on the eyelids as a result of degeneration in the muscle fibres. It is a comparatively harmless condition.

XANTHINE.—This substance, so-called because of the yellow colour of its nitrate, is a complicated organic compound related to uric acid. It arises in the human body from the breaking down of the nuclein protein of the cells and it is excreted in minute quantities in the urine. Xanthine is soluble in weak acids and alkalies and has stimulating effects upon the heart muscle. Occasionally, it is a constituent of kidney stones.

XANTHOMA.—Occasionally, during the course of diabetes mellitus, yellowish swellings appear in the skin. They are surrounded by a red congested area and are termed Xanthoma. The underlying cause is unknown, but it is related to some disturbance of the chemistry of the body. Apart from the disfigurement, they do not cause any complaint. Another variety of xanthoma is described, a rare condition, in which yellow tumours develop widespread in the body. No cause is known for this affection.

XANTHOPSIA.—This is the technical name for yellow vision. To a person suffering from this affection everything appears to be tinted yellow. It occurs sometimes after the administration of the drug santonin which is given to persons infected with round worm. It is a transient condition and disappears when the drug is no longer given.

XERODERMA PIGMENTOSUM, or KAPOSI'S DISEASE.—This somewhat rare disease of the skin has been given a number of names, all long, and none very satisfactory, those above being the two best known. It runs in families, and usually attacks the boys or the girls, not both, in the affected family.

The disease is first noticed in quite early childhood, when the child first begins to play in the open. The face and hands become rough and dry, and no "softening" treatment by ointments betters the condition in the least. A little later, at about the age of three or four, "freckles" appear on all the parts that are exposed, i.e. that are not covered by the clothes. The freckles, however, are much darker than ordinary sun-freckles, and do not disappear during the winter. Later still, little white areas appear on the skin, which shows that there is some

failure of the normal life of the skin, or atrophy, as it is generally called. The skin also begins to shrink, and the eye-lids become drawn down, so that the child has a typical woe-begone look. Next, the capillaries, or tiny blood-vessels of the skin, increase in size, and finally little growths appear. These look at first like tiny moles or warts, but they grow rapidly, become malignant or virulent, break down and ulcerate, and destroy all the neighbouring skin and the tissues beneath. The patient finally dies from the exhaustion brought about by these destructive growths.

The tumours spread by direct growth only; no lymph glands are affected, and secondary growths, or similar tumours in other parts of the body, are never found. The only thing known about the cause of xeroderma is that sunlight helps to develop it. It has been suggested that the tumours arise from unnoticed moles, and that a good result would be obtained by the removal of each one as soon as it grew large enough to be seen. It seems that, instead of the skin protecting the deeper tissues by its usual method of "tanning" all exposed areas alike, it mistakenly places the colouring matter in little heaps here and there.

The outlook is very grave, the disease usually ending fatally; but the patient may live a number of years if very good care is taken of him. Some authorities suggest, from their observations, that if puberty is reached in safety, the disease may in time disappear, or at least progress no further.

Treatment.—This is mainly that of protection from the sun. The little patient must wear a brown veil which covers the neck as well as the face, brown gloves and stockings, not socks. As each tumour appears it is removed. X-rays in some cases cause marked benefit; in others the results have been disappointing, the condition being apparently made worse.

X-RAYS.—Known also as the Röntgen rays, after their inventor, the X-rays are a form of radiant energy, originally derived from the sun. A vast number of radiations are given off by the sun which travel through the ether in waves of different length and vibration. There are the obvious luminous rays, but there are many more invisible rays, the ultra-violet rays, wireless telegraphy rays, X-rays and certain rays of radium.

The X-rays are produced by passing an electric current through a glass tube from which a certain amount of air has been withdrawn. From the cathode or negative pole, rays are given off which are made to focus upon a tungsten plate called the anticathode. From the impact of these rays, X-rays and heat are produced and the X-rays are directed through the tube at a certain angle.

The character of the X-rays varies with the degree of evacuation of the tube and the voltage of the electricity passed through it. If the amount of gas in the tube is large and the voltage relatively low, "soft" rays are produced; these have but little power of penetration of the tissues, and are largely absorbed by the superficial tissues. In contrast, the greater the degree of evacuation and the higher the voltage, the "harder" do the X-rays become. Various devices are therefore used to vary the softness or hardness of the X-rays by altering the amount of gas contained in the tube.

An essential part of an X-ray outfit is the transforming unit, because the electrical supply from the main must be converted into the high tension current necessary to operate the X-ray tube. The average electrical supply varies from 200 to 500 volts, but the tensions required for X-ray work vary from 50,000 volts for diagnostic work to 200,000 for modern treatment purposes.

X-rays are used for investigating the human body and also for the treatment of disease. These rays possess the power of penetrating the body tissues according to their density, so that where only partial penetration takes place shadows are cast, the depth depending on the extent to which the transit of the rays has been blocked. An impression of these shadows can readily be obtained on a screen rendered fluorescent, or on a photographic plate or film. Screening, as the operation is called whereby an impression is thrown on a fluorescent screen, is generally used for the immediate examination of a patient. It is possible then to observe the action of the heart, lungs and abdominal organs. A photographic record on a film is made for more prolonged and detailed study and for record purposes.

To-day, the X-ray examination adds greatly to the accuracy of diagnosis of a great many diseases. There is the obvious value of X-rays in detecting fractures, dis-

locations, and in locating needles, bullets and other metallic objects in the tissues; but the X-rays are equally valuable in investigating the deeper organs. The condition of the heart, great vessels and lungs can be determined by X-ray examination of the chest; the alimentary canal can be photographed by giving the patient a meal containing bismuth and barium, which are opaque to the X-rays, and much information obtained as to their state of functioning. It is even possible to bring such organs as the brain, kidneys and gall bladder within the scope of accurate X-ray diagnosis by the injection into these organs of opaque substances.



Foreign Body (screw) in a small Bronchus of the Right Lung. This was removed by means of a Bronchoscope.

A recent and very important development of X-ray diagnosis is in the detection of dental disease. It is impossiblo to tell the condition of the roots of teeth other than by the use of X-rays, the X-rays have shown that abscesses may exist without any pain or other symptom, yet these abscesses are dangerous to health, by poisoning the blood stream. X-ray films give well-defined pictures of the teeth and reveal clearly any existing infection at the roots.

X-rays as Curative Agent.—Radio-therapy, or treatment of disease by means of X-rays, has made rapid strides in recent years. In the treatment of cancer the value of X-rays is considerable. In some cases, the growth may be completely destroyed, and in others it is so reduced that it is easily removed by operation. In inoperable cancers, X-rays treatment enables the sufferer to live for a longer period and in greater comfort than would otherwise be the case. The term "deep therapy" is applied to X-radiation designed to reach organs affected with malignant disease deeply situated within the body and inaccessible to the surgeon. In the treatment of skin diseases, X-rays are of established value. In ringworm of the scalp, the hair can be caused to fall out and later it will return in a healthy state. Chronic eczema, pruritis, or itching, and lupus, (tuberculosis of the skin) can also be benefited. The X-rays in small doses benefit the skin, but in large doses will produce redness which may go on to actual destruction of the tissue—a so-called X-ray burn. These burns are extremely resistant to treatment and may be followed by cancerous growths, so that great care must be exercised



Courtesy of Addenbrookes Hospital, Cambridge

Treatment of Skin Conditions by X-Rays



Courtesy of the Princess Beatrice Hospital

A Modern Hospital X-Ray Department

in the dosage of X-rays during all forms of treatment. The X-rays are also used in the treatment of certain blood diseases and diseases of the blood-forming organs, and



X-ray photograph of Colles' Fracture: Impacted Fracture of Radius (on left of X-Ray photograph); fracture of Styloid process of Ulna (on right of X-Ray photograph).

occasionally it has proved of value in the treatment of exophthalmic goitre.

The dangers from the use of X-rays may be grouped as immediate and remote. During an actual exposure, the possibility of making a contact with a high-tension lead carrying a very high voltage has to be guarded against. An accident of this kind may easily be fatal, but fortunately most modern forms of apparatus are reasonably protected against such a contingency, though there is need for constant carefulness.

The remote effects are those which may arise from the absorption of the X-rays by the tissues. They do not manifest themselves till long after the exposure. Too large an exposure may lead to burns, warts and cancerous growths; while frequent exposures, even in small doses, may cause a dermatitis which may ultimately become the seat of malignant disease. Also, telangiectasis, a condition in which the blood-vessels of the skin become dilated and prominent, may develop. Constitutional disorders, anæmia, and sterility not infrequently arise in operators who are constantly exposed to X-rays. It may be said, however, that with modern methods of application and protection, the risks and dangers associated with X-ray work are fast diminishing, while the scope of this agency in the treatment and diagnosis of disease is constantly increasing to the great benefit of humanity.



X-ray photograph of the Forearm: Showing Fracture of Shaft of Radius (the outer of the two bones of the forearm).

YAWS.—This is a tropical disease, variously known as frambœsia, purru, parangia and coko, and it is seldom met with in European countries. Yaws is a very contagious disease and is caused by a micro-organism called the treponema pertenue, which is somewhat similar to the organism which causes syphilis, the treponema pallidum. The disease is thought to be carried from one person to another by insects which have become infected from the sores of a sufferer. It may also be spread through direct contact with infected persons or their belongings, and insanitary and unhygienic conditions generally tend to increase its incidence. Infection can only take place through an abrasion or wound of the skin.

There is an incubation period of from 12 to 20 days, during which there may be irregular fever, headache, joint pains and digestive disturbance. These symptoms disappear with the appearance of the sore at the site of the original infection, the commonest sites being the thigh, leg, arm and breast. The eruption commences as a small nodule, which increases in size and finally breaks down, exposing an ulcer which readily bleeds. This sore may heal or else may develop into a large fungating mass. The second stage follows in about two months, when there is a generalized eruption of sores all over the body, excepting the scalp, similar to the original sore. Crops of such sores appear from time to time over a varying period, but the condition may completely terminate at this stage or may pass on to the third stage, when deep-seated ulcers form, and painful swellings in the bones develop.

The diagnosis of yaws is easily made by a microscopic examination of the discharge from the sores, which contain the parasites of the disease. Treatment is by injection into the veins or muscles of salvarsan, novarsenobillon, or other organic arsenical compounds. These are specific remedies, as in the case of syphilis, and rapidly lead to cure. Mercury and bismuth preparations are also used with good results. For prevention, all cases should be isolated and precautions taken to cover up sores and to destroy dressings and so avoid the spread of the parasites.

YEAST.—Yeasts belong to the fungi group of vegetable growths and are found widely distributed in Nature. They are chiefly found in connection with such fruits as the grape. Certain rare diseases are caused by special varieties of yeast, but ordinary yeast is used in bread-making. Its value depends upon the fact that it causes fermentation: the starch of the flour is partly converted into sugar, and in turn converted into alcohol and the carbonic acid gas which ærates the dough and so fills the bread with cavities.

YELLOW FEVER.—This is an acute specific tropical fever, now restricted mainly to West Africa and South America, and characterized by jaundice, bleedings, gastro-intestinal disturbance, and sometimes suppression of urine. The disease affects white people much more than coloured people; it is most prevalent in swampy, low-lying country and in insanitary overcrowded towns.

Yellow fever is caused by a micro-organism which is carried by a special variety of mosquito, called the stegomyia fasciata. If this insect bites a sufferer from yellow fever during the first three days of the illness, it will probably become infected with the parasite and, after an interval of twelve days, will inoculate the disease into any person it may chance to bite.

The stage of incubation is from three to five days, and the onset of the disease is sudden, with severe headache, shivering fits, pains in the muscles and joints, sickness and vomiting. The temperature shoots up: the face becomes flushed, the eyes bloodshot, and within two or three days marked jaundice appears and albumen is present in the urine. About the fourth day the fever remits and the symptoms become less marked and, in favourable cases, the patient recovers. In other cases, however, there is a further rise in temperature, the jaundice returns, there is severe vomiting, sometimes of blood, so-called "black vomit," and there may arise suppression of urine, convulsions and coma. A peculiar feature is that though the temperature rises, the pulse rate falls and may not exceed 70 to the minute with a temperature of 103° F. Death may take place, usually about the sixth or seventh day, from heart-failure or uræmia. Recovery, when it does take place, is often delayed by protracted diarrhœa, or nephritis. One attack confers immunity. The death rate is from 10 to 75 per cent., varying in different epidemics; it is often nearer the higher figure.

In treatment, a special serum invented by Noguchi, if injected during the first day or two of the disease, is likely to be beneficial and lead to recovery, but after the third day this serum is comparatively ineffective. Otherwise the usual methods for the management of fever are adopted. The occurrence of yellow fever has been greatly diminished by the destruction of mosquitoes and by preventing their breeding, and by draining swamps. Persons suffering from the disease should be carefully screened to prevent being bitten by mosquitoes and so spreading the infection. A vaccine is now available in preventing this deadly disease. (*See also* MOSQUITO; TROPICAL HYGIENE.)

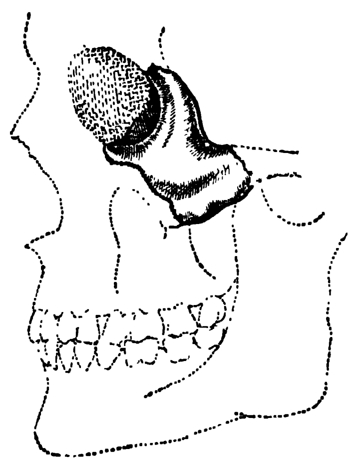
ZINC.—A bluish-white metal, zinc, in various forms, is used in medicine most often for external application. Nowadays, zinc is not much used for internal medication, though occasionally the oxide is given to diminish the excessive sweating which occurs in severe tuberculosis. Zinc sulphate has also a use as an emetic, acting rapidly. It should not be used for this purpose in the case of young children.

Zinc sulphate occurs as thin colourless crystals, resembling those of Epsom salts. In solution, it has a sharp taste and is astringent and mildly antiseptic. It is commonly used as a lotion for the eyes in conjunctivitis, in a strength of 1 grain to the ounce. For stimulating sluggishly healing tissues, as in a varicose ulcer, zinc sulphate is exhibited as red lotion, being combined with tincture of lavender. Zinc oxide and zinc carbonate (prepared calamine) are valuable in the treatment of eczema, pruritus and irritated states of the skin. They are insoluble in water, and if used as a lotion the bottle must be thoroughly shaken up before application.

Zinc ointment consists of zinc oxide and benzoated lard. It has a mildly astringent and antiseptic action, and it is soothing to the skin in slight irritating conditions. Zinc oxide is also contained in Lassar's paste. Along with starch and boracic powder, zinc oxide makes a useful dusting powder and is used where the skin is red and chafed. Many adhesive plasters contain zinc oxide. Zinc chloride is a powerful caustic, and was once used to destroy the unhealthy tissues which develop in lupus and malignant growths. In weak solution it is antiseptic and is used to stimulate healing in wounds, and also as a lotion for the eyes in conjunctivitis.

Chronic zinc poisoning may follow a prolonged course of treatment with zinc preparations: it resembles that caused by lead. Acute poisoning is generally accidental. No emetic should be given, but a weak solution of washing soda or warm strong tea will act as an antidote. Subsequently, demulcent drinks such as egg and milk, or barley water, or olive oil should be given.

ZOSTER.—Herpes Zoster is the medical name for a form of shingles, and the condition is described under the heading SHINGLES.



Zygoma

ZYGOMA.—This is the name applied to a bridge of bone which joins the temporal bone with the malar bone. (*See also* BONE; TEMPORAL BONE.)

ZYMOTIC DISEASE.—This is the name applied to any contagious or infectious disease. The word is derived from Greek and literally means fermentation. The disease-producing agent is always a living micro-organism, although in certain of these diseases, such as measles and chicken-pox, the actual germs have not yet been isolated.

FIRST AID IN EMERGENCIES

THE aim and object of First Aid is to relieve the sufferer of as much paiin and discomfort as possible, and to prevent any further mischief pending the arrival of medical aid.

In a town a doctor can be quickly summoned, but if the accident occurs in outlying parts there may be considerable delay. In such cases prompt action on the right lines will do much to promote the patient's mental, as well as physical, well-being, and may even save his life.

How to act in various emergencies is described in detail in the following pages, but these General Rules apply to all cases of rendering First Aid to the injured.

1. Keep cool yourself, and avoid all appearance of panic.
2. Send someone for a doctor.
3. If there is serious bleeding, tackle this first.
4. Guard against shock by keeping the patient warm.
5. Determine the nature of the accident, and decide upon what treatment should be given.
6. Remove the cause of the injury from the patient, or the patient from the cause, whichever is more expedient.
7. See that the patient is in a position which permits him to breathe. If breathing has ceased take prompt measures to restore it.
8. Do not heedlessly alter the position assumed by the patient. A comfortable posture assists the vital functions.

First Aid Box.—In every camp or workshop a First Aid box must be kept. This is usually painted white and carries a distinctive red cross. It should be in the charge of one individual who has a knowledge of First Aid, and who will be responsible for the box being replenished after use.

Where fifty or more persons are employed, the box should contain the following articles:

1. First Aid manual.
2. Two dozen small, 1 dozen medium, 1 dozen large, sterilized dressings.
3. One dozen burn dressings of different sizes.
4. Two dozen half-ounce packets of cotton wool.
5. Six ounces of 2 per cent. alcoholic solution of iodine in a stoppered bottle.
6. A bottle of sal volatile with directions for use on the label.
7. Eye-drops (prescribed by doctor).[1]
8. Splints and cotton wool or other padding.
9. Adhesive plaster, one 2-inch reel.
10. A tourniquet.
11. One dozen roller bandages, 1 dozen triangular bandages.
12. Safety pins.

ABDOMINAL INJURIES, FIRST AID TO.—Accidents to the soft parts of the body, especially the abdomen, are some of the worst that can be met with, and they are unfortunately frequent in these days when so many people are hurt by motor car traffic and by the great pieces of machinery in works. When a person has been run over or crushed, the skin and flesh of the abdomen are almost certain to give way, and the direction in which they have been torn or have given way is of importance when considering what to do for the best until the doctor arrives. Three things may happen: the belly may be burst open and various organs, such as the bowels, may protrude through the opening. If this happens, keep the person lying down flat on the back. Uncover the injury by removing or cutting away the clothing. Take a towel, napkin or other large piece of cloth, whatever may be clean and handy. Wring it out of water as hot as can be borne, and lay it over the wound, well covering it and the area around. Cover with any clean bandaging material and keep the patient warm. Do not give any food or drink. Change the

[1] Eye-drops:
Cocaine 0·5 per cent; Hydrarg. perchlor. in castor oil 1 in 3,000.
Directions to pharmacist: Weigh 95 grammes of castor oil into a large flask and add 0·5 gramme of powdered cocaine. Warm on a water bath till dissolved. When the solution has cooled somewhat, but is still warm, add 1 c.c. of a solution containing 3·3 grammes of mercuric chloride in 100 c.c.

dressing every half-hour until the doctor arrives.

If no organs are protruding, proceed as follows: If the skin is broken in an up and down direction, keep the person lying flat on the back with the legs stretched out. If, however, the injury is from left to right, still keep the patient on his back, but in this case draw up the knees and put a pillow under them and under the head and shoulders. Dress the wound and bandage firmly. Keep the injured person as warm as possible, give no food or drink. Of course in all abdominal injuries a doctor should be sent for at once, as it is impossible for untrained persons to know what may have been the extent of the damage done to the delicate organs inside the abdomen.

Sometimes an internal organ, usually a loop of the bowel, pushes through a weak place in the wall of the abdomen under the skin. When it gets fixed or "strangulated" it causes swelling, pain and severe sickness. This is called a rupture or hernia. When this occurs, treat it as you would an accident. Send for the doctor. Lay the patient on his back with knees drawn up and head and shoulders supported by a pillow. Apply ice or cold water compresses to the swelling.

ARTIFICIAL RESPIRATION is used to restore the natural act of breathing to a person whose breathing has ceased, but whose life is not yet extinct.

Schafer's method is generally employed. It is performed as follows:

(*a*) Loosen the clothing round the neck, turn the patient on to his face, with arms extended beyond the head, which is turned slightly to one side so that the mouth and nose are clear of the ground.

(*b*) Kneel astride the patient facing his head. Place your hands over his lower ribs, the thumbs pointing inwards and close to the spine, the fingers open and directed towards the shoulders.

(*c*) Keeping the arms rigid, lean forward, pressing firmly and steadily downward so as to expel the air, and any water that may be there, from the patient's lungs.

(*d*) Draw back on to your heels and relax the pressure; do not take your hands away.

(*e*) Continue this to and fro movement rhythmically about 15 times a minute.

Persevere with the movements for at least one hour, or until the doctor comes. During the treatment an assistant can help by applying smelling salts to the nostrils.

When the patient begins to breathe naturally, adjust the rhythm of your movements to his respiration.

Be ready to recommence the treatment at once if his breathing should again fail. (*See also* ARTIFICIAL RESPIRATION.)

BANDAGING.—The subject of bandaging is treated in great detail in the article on BANDAGES AND BANDAGING. A knowledge of bandaging is always useful in everyday life, and it is also a subject in which skill is acquired by practice. It is not necessary to wait for an accident in order to practise bandaging. Anyone who likes neat use of the hands will obtain a certain amount of pleasure from learning the use of the various forms of bandages and slings, and will easily find friends who will allow themselves to be practised upon from time to time. For this reason, because bandaging is a little accomplishment that can be learnt and practised at home without much expense or trouble, the subject has been treated as fully as it would be in a medical text-book.

Two principal sorts of bandages are the roller and the triangle. The first is the ordinary rolled-up narrow bandage, and the triangle is a large triangular piece of calico which is usually known as a sling. In First Aid work bandages may have to be improvised from such materials as clean handkerchiefs, strips of shirts or petticoats, towels, curtains or any clean, white material that may be at hand. Dyed materials are not suitable, and, of course, the highest degree of cleanliness possible under the circumstances should be obtained.

BITES AND STINGS. Snakes, dogs and rabid animals.—In the case of bites by snakes, poison has been injected by the snake into the wound, causing immediate danger to life unless the poison can be stopped before it gets into the general circulation. There is not much danger from hydrophobia in this country, but where it is suspected that the animal which caused the wound, whether dog, wolf, cat, etc., was suffering from *rabies*, the condition must be treated as if it were a venomous snake bite, and in addition arrangements must be made for the bitten person to receive the Pasteur inoculation

treatment at the earliest possible moment. The local medical officer of health can give information on this subject.

Treatment.—Bind a tight bandage or tourniquet of some sort with the utmost speed between the injury and the heart so as to stop the circulation. Two or three bandages a short distance apart are better than one. Wash out the wound by holding it under a tap, or suck it hard and spit out the blood. Keep the part low. This encourages bleeding, and thus helps to wash out the poison. Pour some tincture of iodine, methylated spirits or even whisky into the wound. Take the bitten person to a doctor without delay. If no doctor is available, put a drop or two of fluid caustic such as nitric or carbolic acid into the wound on the end of a pointed match.

Dog, cat, pig and other Bites.—In the case of ordinary dog bites, and the bites of other animals where the animal is not suspected of being mad, treat as for an ordinary open wound. (*See also* WOUNDS.)

Insect Stings.—Bees, wasps and other insects can cause serious injury by their bites, especially if the sting is on the face or, as sometimes happens, on the tongue or in the mouth. A bee leaves its sting in the wound, so find it and pull it out. Bathe the part freely with methylated spirit, iodine or weak ammonia. Baking soda, washing soda, the ordinary blue bag or an onion may all be rubbed in to counteract the action of the poison from the sting. (*See also* BITES AND STINGS.)

BLADDER, INJURY TO.—A crush which fractures the pelvis, or haunch-bone, may injure the bladder.

The symptoms are inability to pass urine, or if some is passed it is tinged with blood.

Treatment.—(*a*) Send for a doctor quickly, or take the patient to hospital on a stretcher. (*b*) Keep the patient recumbent, quiet and warm.

The passing of blood-tinged urine following an accident to the abdomen is always serious.

BLEEDING, or HÆMORRHAGE. *Blood-vessels.*—A detailed knowledge of the blood system is unnecessary, but a general idea of the principal vessels is easily acquired and a great help in First Aid work.

The blood leaves the heart by the *aorta*, a large vessel which, forming an arch behind the breast bone, passes down on the left side of the spine. Just below the level of the navel it divides into two branches—the *iliacs*—which supply the organs of the pelvis and lower limbs.

The aorta gives off various branches. From the arch springs the main supply to the head, the *carotid* artery on each side of the neck. These vessels run up from the collar bone, and can be felt pulsating at either side of the throat. From the carotid flows the *facial* artery, which supplies the greater part of the face. This vessel passes across the edge of the lower jaw in a slight hollow about an inch in front of the angle of the jaw. The *temporal* artery, which supplies the forehead and front of the scalp, passes in front of the upper part of the ear, and the *occipital*, which supplies the back of the scalp, passes about 2½ inches behind the ear.

The *subclavian* is a short artery which runs from behind the inner end of the collar bone to the armpit; it then becomes the *brachial* artery and runs down the inner side of the arm to the elbow. There it divides into two—the *radial* and *ulnar* arteries—which run down the front of the forearm on the outer and inner sides respectively. These arteries meet again in the *palmar arches* in the palm of the hand.

The two main arteries in which the aorta ends—the *iliacs*—pass into the thighs just to the inner side of the centre point of the groins. They are now called the *femoral* arteries, and pass down the inner side of the thigh for about two-thirds of its length. They then run behind the thigh bone to the back of the knee joint. Dividing into two, one part passes down the front and the other down the back of the leg to unite again in an arch in the sole of the foot.

Treatment of Hæmorrhage.—Hæmorrhage is of three kinds:

1. From an Artery (Arterial).—This condition is dangerous and calls for prompt treatment. It is readily distinguished from the other forms as the blood is scarlet, and, if the wounded artery is near the surface, spurts in jets corresponding to the heart beats.

Get the patient into a suitable position, the more prostrate the better, and, except when dealing with a fractured limb, elevate the bleeding part so as to reduce the flow of

blood to it. If there is no fractured bone nor foreign body in the wound, apply direct pressure with the fingers or thumb over the wound. If a fracture or the presence of a foreign body be suspected, or if the wound is large, apply indirect pressure by pressing on the appropriate pressure point next to the wound on the heart side. Maintain the pressure by means of a *pad and bandage*, or a *tourniquet*.

A *pad* may be improvised from a folded handkerchief, a knot in the centre of the bandage, with or without a stone enclosed, and should be accurately placed on the pressure point and firmly bound in position.

A *tourniquet* consists of a band of some sort, which is provided with a means of being tightened. It is passed round the bleeding limb above the injury with the object of squeezing the artery and preventing the further escape of blood. It should not be applied directly to the skin, but only through the clothing or over a folded cloth.

A tourniquet may be improvised as follows: Place a pad accurately on the pressure point and encircle the limb with a narrow bandage, necktie, strap or a piece of cord. Opposite the pad tie a half knot and then a reef knot. Between the knots insert a short, strong piece of wood such as a pencil. Twist to tighten the band and so bring pressure to bear on the pad. Fix the stick in position with another bandage or in the folds of the tourniquet. The best sites for a tourniquet are the middle of the upper arm or thigh. They are not so efficient below the knee or elbow.

A piece of rubber tubing is the best kind of tourniquet. In this case no twisting is necessary, the rubber being passed twice or thrice round the limb and pulled tight each time.

Precautions to be observed when using a tourniquet:

A tourniquet *must* be slackened off after it has been in position for 15 minutes. If the bleeding recurs, tighten up again and loosen every 15 minutes. Neglect to do this may have deplorable results. If the blood-supply to the limb is cut off for too long, the part may atrophy. Or prolonged pressure on a nerve may cause paralysis.

2. From a Vein (Venous).—In this case the blood is dark red, flows evenly from the wound and does not spurt. It is always easier to stop and less dangerous than arterial bleeding. Press with the fingers or thumb, unless there is a fractured bone or foreign body in the wound. Loosen any tight clothing between the wound and the heart, e.g. collar, corsets or garters. Place a pad over the wound and bandage firmly (lightly if there is a fracture or foreign body). If the bleeding continues, apply a firm bandage to the part below the wound on the side away from the heart.

3. Capillary Hæmorrhage.—In this case the blood is medium red, and generally oozes evenly from all parts of the wound. Apply a dressing and bandage firmly.

The above are the general principles of treating hæmorrhage, but it must be understood that the wound requires treatment as well as the hæmorrhage. Before the wound can be treated, however, the hæmorrhage must be stopped, and in doing this the First Aid worker should take all reasonable care that the wound does not become infected or septic. He must, therefore, endeavour to exclude germs by protecting the wound, and he must avoid doing anything which might introduce germs into the wound.

Hæmorrhage from various parts of the body.

The Scalp.—Scalp wounds usually bleed freely, and often look more serious than they are. If there is no fracture of the skull, bleeding is generally stopped by tying a narrow bandage firmly round the head with the knot or a pad over the bleeding point. If this fails, for a wound on the front of the scalp exert pressure on the temporal artery just in front of the ear on the injured side. If the wound is at the back, press the occipital artery at the base of the skull at a point four fingers breadth behind the edge of the ear.

If the patient is unconscious, or the wound either extensive or associated with a fracture of the skull, use a ring pad. To make this, take a narrow bandage and wind one end several times round the fingers of the left hand to form a ring. When within two feet of the other end, stop and pass the free end through the ring again and again until it is used up. Place the ring pad over the wound and bandage firmly in position.

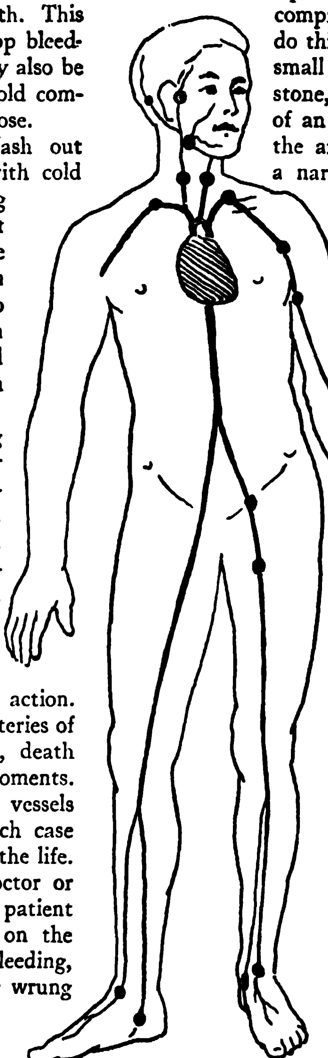
The Face.—Press on the facial artery where it crosses the jaw bone about one inch in front of the angle of the jaw. If the lips are bleeding, pressure may be needed on both jaws in order to stop it effectively.

The Nose.—Make the patient sit in a chair before an open window with his head thrown back. On no account let him bend over a basin. Loosen any tight clothing about the throat or chest and make him breathe through his mouth. This is usually enough to stop bleeding, but the nostrils may also be pinched firmly and a cold compress applied over the nose.

A Tooth Socket.—Wash out the mouth repeatedly with cold water. If the bleeding continues, plug the socket with cotton wool, place a small pad over the gum and tell the patient to bite on it. Hydrogen peroxide is very useful for stopping bleeding in the mouth.

The Ear. — Bleeding from within the ear after an accident generally indicates a fractured skull. Do not plug the ear. Apply lightly a dry absorbent dressing and send for medical aid.

The Throat.—A cut throat is generally a suicidal or homicidal action. If the large veins and arteries of the throat are severed, death will follow in a few moments. But frequently these vessels are not severed, in which case prompt action can save the life. Therefore send for a doctor or an ambulance; get the patient flat on his back. Press on the wound to arrest the bleeding, and plug with a dressing wrung out of antiseptic. Apply a second large dressing and bandage. Keep patient warm and raise his legs.



Pressure Points

The Armpit.—Compress the subclavian artery (*see* illustration on page 65). Face the patient and place the hand close in on the shoulder so that the thumb lies in the hollow above and behind the collar-bone and the fingers round the back of the neck. Press the thumb downwards and backwards on to the first rib. This is more readily done if the injured side is kept well forward and the patient's head turned away.

The Upper Arm. *Arterial Bleeding.*—If direct pressure on the wound has failed, compress the artery in the armpit. To do this, roll up in a piece of cloth some small hard object, such as a golf ball or stone, to form a firm pad about the size of an orange. Push this well up into the armpit and fix it in position with a narrow bandage. Place the centre of the bandage over the pad and carry up the ends one in front of, and the other behind, the shoulder. Cross the ends on top of the shoulder and pass them round the body to meet under the armpit on the uninjured side. Tie tightly. Bend the forearm across the front of the body and bandage the injured limb firmly to the side.

The Forearm. *Arterial Bleeding.*—Apply a tourniquet to the brachial artery pressure point (*see* illustration on page 65); or place a pad in the elbow joint, bend the forearm right back and bandage it to the upper arm. This compresses the artery.

The Palm of the Hand.—The two arteries of the forearm—the radial and the ulnar—join in a complex system of blood-vessels in the palm of the hand. An injury to this part may bleed profusely from both ends of the cut vessels.

If no foreign body, such as broken glass, is present, quickly improvise a firm pad and place it in the injured palm. Make the patient grasp it and then bind the fingers tightly with a narrow bandage.

As an additional measure, or if a fracture or foreign body is present, compress the wrist arteries as follows:

Procure two small objects such as corks or pieces of pencil, lay them on the wrist

pulses and bind firmly. The radial pulse is easily found just below the root of the thumb. The other artery—ulnar—is in a corresponding position on the little finger side of the wrist.

Should the bleeding still persist, compress the brachial artery as described under "Forearm."

The Fingers.—Serious bleeding from a severed finger may be stopped by binding the stump firmly.

The Thigh.—Stop arterial bleeding from the thigh by pressing on the femoral artery where it crosses the mid-point of the groin (*see* illustration on page 65). Lay the patient on his back and raise the leg. Kneel facing him and pass the fingers of one hand inside and those of the other hand outside the top of the thigh. The two thumbs will fall together over the groin and may be jointly used to exert pressure. Meanwhile an assistant can prepare a tourniquet. The femoral artery passes from the groin down the inner side of the thigh to the back of the knee. Place the tourniquet high up on the thigh and use a firm pad the size of an average apple. Hæmorrhage from the femoral artery is very serious, and prompt action is imperative.

The Foot and Leg.—Press with the fingers on the wound, and then fix a pad and bandage tightly.

If the bleeding is severe and the above treatment fails, compress the artery by pad and flexion. Lay the patient on his back and place a firm pad the size of a tennis ball behind the knee. Raise and bend the knee until the calf touches the back of the thigh. Fix the limb in this position with a narrow bandage, handkerchief or necktie.

Varicose Veins.—Lay the patient flat and raise the limb. Apply a pad and bandage over the bleeding point and two narrow bandages one above and below. The two are used because a ruptured varicose vein is liable to bleed from both ends. They may be removed 15 minutes later.

Bleeding from the Lungs.—Spitting blood (hæmoptysis). In this case blood is coughed up and is bright red and frothy. The cause may be:

(*a*) Disease of the lungs (consumption).

(*b*) Injury to the lungs by a knife or bullet wound, or by a crushing accident. This is always a serious condition.

In either case treat as follows: Place the patient on his back and keep him perfectly still. Loosen any tight clothing and allow free circulation of air around him. If any is available, give him ice to suck. Send for a doctor at once.

Bleeding from the Stomach.—Vomiting blood (hæmatemesis). This may be due to:

(*a*) Disease, such as an ulcer or growth.

(*b*) Injury, such as a bullet or knife wound.

The blood is very dark and, being mixed with particles of food, often resembles coffee grounds.

Get the patient to bed and keep him as quiet as possible until the doctor comes. Apply cloths wrung out of cold water, or an ice pack, to the pit of the stomach. Give no food or drink.

Internal Hæmorrhage.—A bullet wound or stab, a run-over or similar crushing accident may damage internal organs and cause concealed hæmorrhage. The symptoms are:

(*a*) Giddiness and rapid loss of strength.

(*b*) Pallor, thirst, failing pulse.

(*c*) Restlessness and "air-hunger."

Treatment.—Send at once for medical aid. Lay the patient down flat and loosen any tight clothing. Provide free circulation of air, but keep the patient warm with rugs, etc. Ice may be sucked, but *no* food or fluid may be given by mouth. If there are signs of collapse, raise the feet and bandage the limbs from fingers to armpits and from toes to groins.

BRUISES.—A bruise is damage to the small blood-vessels beneath the skin without breaking of the skin, and is accompanied by pain, discoloration, and swelling.

Bruises cure naturally in two or three weeks, but the discomfort and swelling can be reduced and the affected area limited by prompt treatment.

Apply a piece of lint or a clean, folded handkerchief which has been soaked in equal parts of methylated spirits and water, and bandage firmly. Renew this dressing every four hours. Ice is useful as it relieves the pain, but it does not stop the bruise spreading unless applied immediately. Try to rest the injured part.

BURNS AND SCALDS.—*A Burn* may be caused by dry heat, such as fire or hot metal; by lightning or an electric current;

corrosive acid, such as nitric acid or vitriol; a corrosive alkali, such as caustic soda, caustic potash, or quicklime.

A Scald is caused by moist heat, such as boiling liquids, steam, hot oil or tar. The extent of the damage varies from a mere reddening of the surface of the skin to a charring of deep tissues. The degree of the damage depends upon the intensity of the heat and the length of exposure.

The dangers are *shock* and *blood-poisoning.*

Treatment of Scalds and Burns caused by dry heat, electricity, or friction.

Cautiously remove the clothing and, if it sticks to the skin, cut round it with scissors. Put the injured part immediately into a bath of water at body heat (98·4° Fahr.) while the dressings are being got ready. Apply strips of lint, gauze, or linen soaked in a solution of one dessertspoonful of baking powder (sodium bicarbonate) in a pint of warm water, or a 1 per cent. solution of picric acid. Keep the dressing moist. If the burn is slight, take the patient to the doctor. If it is severe, treat for shock and send for the doctor or the ambulance.

An oily dressing such as vaseline, lanoline, cold cream or olive oil may be used if no baking powder is at hand. In this case, if the burn is at all extensive, several small overlapping dressings should be applied. The reason for this is to minimize the pain of their removal, and to expose only a small area of the burn to the air at one time. The application of an oily dressing relieves the pain at the time, but as it complicates the subsequent treatment, either of the soothing lotions given above is to be preferred. The best modern treatment of burns is by the application or the spraying on of a weak solution of tannic acid; suitable First Aid outfits of this are now obtainable and should be kept in workshops, etc., where burns are likely to be met with.

If a person's clothes catch fire, anyone coming to the rescue should first *make the sufferer lie flat on the ground* at once with the burning side uppermost, then *seize a blanket, rug, coat or tablecloth* and smother the flames. The person whose clothes are alight must lie flat, because flame rises and will quickly reach the head and neck, if he or she remains standing or kneeling. Similarly he or she must not lie with the flames underneath, or they will pass round and burn the body. As soon as the flames are extinguished, reassure the patient, treat for shock by giving coffee, etc., and attend to the burns. Anyone whose clothing is alight should not rush to the window, or into the open air. Fireguards, if more extensively used, would prevent many catastrophes.

If a face is burned, cut out a mask of lint or linen with holes for eyes, nose and mouth. This should be soaked in lotion and applied, and the lips, eyelids and nostrils smeared with a little boracic ointment or vaseline and a drop of castor oil put into each eye.

Burns caused by Acids.—If it can be obtained *quickly*, bathe the part in an alkaline solution, such as ammonia, or fluid magnesia, or a dessertspoonful of baking powder or washing soda may be used in a pint of warm water. Otherwise flood the part with warm water, and treat as a burn.

Electric Burns.—These resemble burns caused by fire, but are often deeper and more severe. If possible switch off the current. Usually the switch is some distance from the scene of the accident, and it is not possible to do so. In that case try to drag the sufferer out of contact with the current, by means of a non-conductor, such as a loop of rope, or the crook of a walking-stick. *Do not use an umbrella*, as the ribs are generally thin sticks of metal, which might conduct the current to the rescuer. Stand on a dry board, or folded dry mackintosh, or other non-conducting material. Protect the hands by using rubber gloves, a rubber tobacco pouch, dry mackintosh, or other dry garments. If the rescuer fails to adopt these precautions, he risks receiving a dangerous shock himself. Remember that moisture is a conductor of electricity, and do not make use of any damp or wet article. As soon as the patient is out of contact with the current, treat for shock and burns.

Burns caused by Alkalis (caustic soda, potash, quicklime, etc.).—If it can be quickly obtained, bathe the part in a weak acid solution, such as vinegar or lemon juice diluted with an equal quantity of water. Otherwise flood the part with warm water, first having taken care to dust off any quicklime remaining on the burnt part.

Burns of the Eye.—Burns of the eye may occur from hot metal, acids, or other destructive chemical fluids. A slight burn,

severe enough to injure but not destroy the nerves of the cornea (the transparent membrane through which we see), causes great pain; it is occasionally seen when curling tongs have accidentally touched the eye, but may occur with any form of burning. This is best treated by atropine drops and then by a soothing ointment such as lanoline.

The more serious burns are those caused by lime, strong acids such as sulphuric (vitriol), and a splash of molten metal, usually lead. As time is everything in a good many of these cases, even a matter of seconds making a difference, it is necessary to know the "first aid" treatment, though naturally the injured person should be taken to an oculist as soon as possible. In cases of lime burning, as much lime as possible should be quickly but *very gently*, without actually touching the eye, brushed away, and the eye bathed thoroughly with weak sugar and water, or vinegar and water, used warm. Two teaspoonfuls of each to the pint is sufficient. Plenty of this should be used to wash away the lime as rapidly and thoroughly as possible. It must be reiterated that the eye itself must not be touched, or the damage may be made worse. A little olive or castor oil should then be dropped into the eye, a soft clean pad put on, and the eye bandaged gently.

In cases of acid burning, a solution of sodium bicarbonate, 1 teaspoonful to the pint of warm water, may be used as a wash, the rest of the treatment proceeding as before. In lead burning, if the lead can be seen *loose* in the eye (usually in the pocket formed by the lower eyelid), it may be gently removed, but if there is destruction of the tissue, as frequently happens, oil should be used, and the pad and bandage as before, the bandage being just sufficiently firm to keep the eyeball steady until the eye can be medically examined.

There is an important difference between chemical and metallic burns. In lead burning, the moisture of the eye causes the lead to slide off the eyeball itself, and though it often does considerable damage to the soft tissues in the eyelid pocket, the danger to sight may be small. Even if burns appear on the eyeball itself, the tendency is towards healing. Exactly the contrary is the case in chemical burns. The moisture on the surface of the eye gives no sort of protection in these cases, and the cornea may in a bad case be immediately transformed into a dense white tissue which can never regain its transparency; and, later, the burnt tissues often separate or "slough out," and the eye be lost altogether. One may say that in metallic burns the worst is seen at once, but in chemical burns the ultimate damage is invariably much greater than at first appears.

When healing takes place, a condition known as *Symblepharon* is common. This occurs when the opposing membranous surfaces between the lids and the eyeball have both been damaged, and in healing become united by a single scar. This is a very distressing condition, and the patient is often anxious to have a corrective operation. This has its dangers, however, as there has often been so much destruction of tissue that the eyelid is practically the wall of the eyeball itself, and interference might result in blinding the eye completely. Lately, "cargile tissue" has been used successfully in promising cases.

Treatment of Scalds.—The damage being similar to that of a burn, treatment is along the same lines.

Scalded Foot or Leg.—If there is shock, treat first for this; otherwise tackle the foot. Make the patient lie down and remove boot or shoe by cutting lace, and if necessary the leather. Cut away the sock, but in doing so avoid touching the patient's limb with knife or scissors.

Treat and dress as for a burn.

Scalded Throat.—The danger here is from the swelling that may occur at the top of the windpipe. This may lead to suffocation through interfering with the breathing. Treat as follows:

Lay the patient down, or, better, get him to bed. Apply cloths wrung out of water as hot as can be borne to the front of the throat from chin to collar-bones. Give ice to suck, or, failing ice, sips of cold water. Send for medical aid.

CARRYING A HELPLESS PERSON.—*When single handed* and strong enough, lift the patient by passing one arm beneath his knees and the other round his back. This is known as the "Cradle."

If the patient is too heavy for the cradle or only partially incapacitated, stand close by his side, put one arm round his waist



Carrying a Helpless Person

and grasp his far hip. Then draw his nearside arm round your neck and over your shoulder, where you hold his hand with your free hand. This is known as the "Human Crutch."

Fireman's Lift.—A very useful method of carrying an unconscious patient, which also leaves one hand free to use in descending a ladder, and is therefore called the "Fireman's Lift," is as follows: The helpless person is turned on his face on the ground and the bearer puts his hands under his arms and drags him to a kneeling position, then to a standing position. To get the patient to a standing position, the bearer should stoop, place the patient's right arm round his own neck while he thrusts his own right arm round the right thigh of the patient, placing his right shoulder against the middle of the patient's body to steady himself. He should then rise slowly to the erect position, grasping the patient's right hand with the right hand. This leaves the patient steadily poised on the right shoulder whilst the left hand of the bearer is free. Instead of grasping the patient by the right thigh only, it may be more convenient to pass the arm round both the legs just above the knees. Alternatively, the patient may be carried "pick-a-back" where it is possible to get him into this position.

When two bearers are available.

The Two-handed Seat.—This is used if the patient is totally incapacitated. The two bearers stand facing each other,

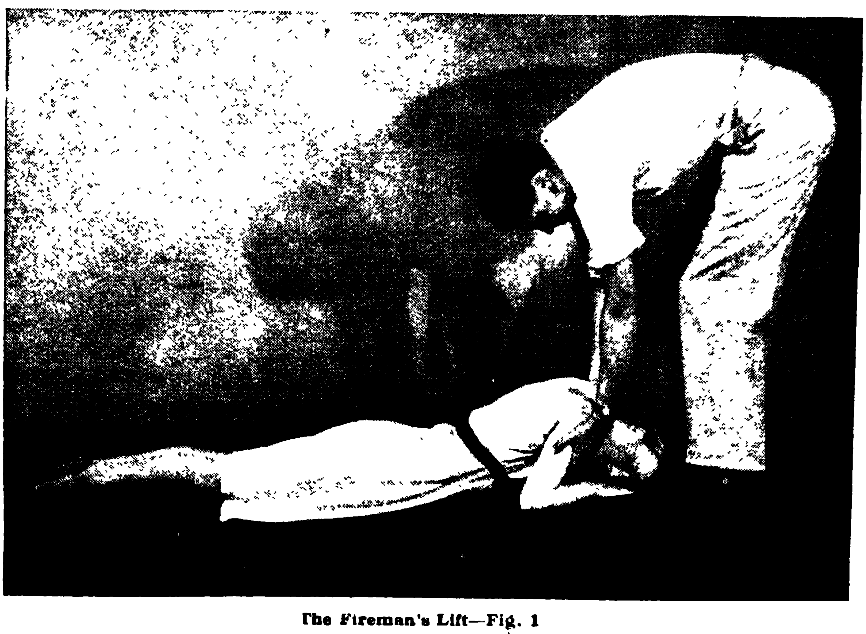


The Human Crutch



Improvised Stretcher with Blanket and Poles

one on each side of the patient. They stoop down and each passes his rear forearm under the patient's back below the shoulders and grasps his clothing After slightly raising his back, they pass their other forearms beneath the middle of the patient's thighs and grasp hands. They rise and step off together, the left bearer



The Fireman's Lift—Fig. 1



The Fireman's Lift—Fig. 2

panion similarly supports the legs. They rise and move off in short sidesteps, the patient's feet foremost.

The Three-handed Seat.—This is employed when a patient can use one or both of his arms but needs support for one of his legs, e.g. in the case of a sprain.

The two bearers go behind the patient and face each other. To support the right leg, the bearer on the patient's left holds his own right wrist with his left hand. The other bearer holds the first bearer's left wrist with his left hand, leaving his right hand free to support the patient's right leg. (If it is necessary to support the patient's *left* leg, substitute "left" for "right" and "right" for "left" throughout the foregoing instructions.) The bearers then stoop, the



The Fireman's Lift—Fig. 3

patient passes an arm round one or both of their necks and sits upon their hands. The

with the left foot, the right bearer with the right.

In a narrow passage where the two-handed seat cannot be used, the fore-and-aft method may be employed. In this case one helper stands behind the patient, bends down, and passing his forearms under the patient's armpits, clasps his hands. The other helper stands with his back to the patient between the latter's legs. He bends down and passes his forearms under the patient's knees. Both rise together and carry patient away. For lifting and carrying a patient in a recumbent position, use the "Human Stretcher." The two bearers stand facing each other, one on each side of the patient. They bend down and clasp their left hands beneath the patient's hips as in a handshake. Then the bearer on the left supports the head and shoulders with his right hand and forearm while his com-



Two-handed Seat

bearer with a free arm supports the injured lower limb. They rise together and move off, the left bearer with the left foot; the right bearer with the right.

Stretchers may be improvised thus:

1. Take two or three coats and turn the sleeves inside out. Pass two strong poles through the sleeves and button up the coats. Separate the poles by binding cross pieces of wood at either end. Instead of coats, sacks may be pressed into service, in which case holes must be made in the bottom corners.

2. Spread out on the ground a rug, tarpaulin, or blanket and roll up two strong poles in the sides. The bearers stand on either side and grasp the covered poles in the centre and near the end.

3. A hurdle, ladder, door, or broad plank may be utilized. Place some hay, straw, or clothing thereon and cover this with a piece of sacking, a blanket or a rug by means of which the injured person may be carefully lifted off.

N.B.—Be sure to test the safety of any such improvised stretchers before they are used.

CHILDBIRTH, SUDDEN.—Occasionally a woman who has already had several children may give birth to a child unexpectedly when away from home.

The object of First Aid in such a case is to keep the baby alive and to save the mother from bleeding to death.

Treatment.—1. Make the woman lie on her back, and do not move her unless absolutely necessary. On no account let her walk or move about.



The Human Stretcher

2. Send for some qualified person—doctor, midwife or nurse—to attend to her.

3. The child will be attached to the mother by a white cord. About six inches from the baby and an inch apart tie two pieces of string tightly round the cord and cut it with the cleanest knife or scissors available. Wrap up the child and smack it to make it breathe.

4. Loosen the clothes and press on the lower part of the woman's abdomen. If the bleeding is severe, press all the harder.

5. Do not clean up blood-clots, etc., as the doctor or midwife will want to see them, to ascertain whether the after-birth has come away.

CRAMP.—So-called attacks of "cramp" in swimming are often heart attacks or may be caused by a heavy meal before the swim; or they may be due to too long immersion in cold water. An attack of cramp in a limb is a muscular spasm and often takes place where varicose veins are present. Take hold of the foot and turn the toes firmly upwards; this will relieve the spasm and the foot should be kept in this position until the spasm passes off, in a few minutes.

DISLOCATION.—When one or more of the bones at a joint are displaced, they are said to be dislocated, or out of joint.

The First Aid worker should not attempt to put the bones back into place.

The joints most commonly dislocated are the shoulder (adults), elbow (children), fingers, thumb, and lower jaw.

Signs and Symptoms are: 1. Severe *pain*, often of a sickening character, at or near the joint.

2. *Loss of movement* of the limb and fixity of the joint.

3. By comparison with the corresponding uninjured joint there is *deformity*; a hollow where the displaced bone should be, and a prominence where it is.

4. The limb usually assumes an abnormal attitude.

5. *Swelling* occurs owing to damage to small blood-vessels.

Dislocated Shoulder.—Treatment.—(*a*) If the accident occurs *out-of-doors:*

Support the limb in the position most comfortable to the patient, and least susceptible to jolting or jarring during transport to the doctor. Loosen the clothing round the seat of injury.

(*b*) If the accident occurs *indoors:*

If the patient is unable to go to a doctor, send for one. Meanwhile rest the patient on a couch or bed and gently remove the clothing round the injured part.

Apply cold dressings to the injury.

Give no food, as an anæsthetic may be needed later.

Dislocated Elbow.—This injury seldom happens to persons over twenty-five. Support the arm in a large sling and take the patient to a doctor.

Dislocation of Hip or Knee.—This is a very serious injury, fortunately also very rare. The First Aid treatment is to use a long splint fixed outside the leg, or the two legs may be bandaged together. The patient should be carefully lifted and taken at once to a doctor or hospital.

Dislocated Jaw.—A yawn or a blow may put the lower jaw "out of joint." Remove false teeth if any, and go to or send for a doctor to reduce the dislocation.

Compound Dislocation.—A dislocation is said to be compound when the bone protrudes through the skin.

Place a clean dressing over the damaged tissues and cover with a layer of cotton wool.

Support the limb in the position the patient finds most comfortable and transport carefully to hospital or doctor.

DRESSINGS.—A dressing should be absorbent and sterile (germ-free). Suitable materials are gauze, lint, cotton, linen, or muslin. They may be sterilized by boiling in water for twenty minutes; baking in an oven, or by soaking in an antiseptic solution, such as 1 in 40 carbolic acid (one tablespoonful of pure carbolic acid in a quart of water after taking out one tablespoonful of the water) or a weak solution of lysol.

Dressings may be improvised from a *clean* handkerchief, towel, or bandage.

Infected, or septic, wounds require wet dressings and fomentations. Squeeze the dressing as dry as possible before application.

To make a *hot fomentation*, place a piece of lint, flannel, or towelling larger than the affected area in the folds of a small face towel. Still holding the ends of the towel, submerge the dressing in boiling water. Lift and wring out thoroughly and quickly. Apply the dressing as hot as can be borne and cover with jaconet, cotton-wool and a bandage.

Cold Compress.—Soak a piece of towel, lint, flannel, or cotton-wool in the coldest

water obtainable. Wring it so that it does not drip, but do not squeeze it dry. Place it on the part and add a little water from a sponge every half-hour. Do not cover up a cold compress, as it is required to evaporate. If a tablespoonful of methylated spirit is added to each pint of water, the evaporation is greater.

FOREIGN BODIES.—A foreign body is anything situated in a part of the human body to which it does not normally belong, e.g. a broken needle embedded in the hand, or a smut in the eye.

In the Ear.—If an insect enters the ear, make the patient lie down with the affected ear uppermost, and pour warm olive, castor, or sweet oil into the ear passage. The insect will float to the surface and can be removed. For any other sort of foreign body in the ear seek a doctor. Never probe into, or syringe, the ear.

In the Nose.—Tell the patient to pinch the unaffected nostril and blow his nose hard. Induce sneezing by pepper. If this fails, consult a doctor.

In the Eye.—First prevent the patient rubbing the eye. Then pull down the lower eyelid. If the foreign body can be seen, remove it with the corner of a clean handkerchief moistened in clean water. If the foreign body is underneath the upper lid, pull this outwards and downwards; push up the lower lid inside it and let go. The lashes of the lower lid in this way may wipe away the body. Let the patient blow his nose violently. This may dislodge the particle into a more accessible spot.

If an iron filing or similar object is embedded in the eye and cannot be easily removed, drop olive or castor oil under the lower lid to relieve the irritation, apply a soft pad, and take the patient to a doctor.

For *quicklime* in the eye, first brush away as much as possible. Then bathe the eye in warm water containing vinegar or lime juice. If these are not to hand, wash freely in warm water and apply oil.

For vitriol or other strong acid in the eye, bathe the eye in a solution of baking powder (bicarbonate of soda)—1 dessert-spoonful in a pint of warm water. Prevent rubbing and apply oil.

In the Throat, air or food passages.—If the foreign body cannot be dislodged by smacking the affected person on the back or holding a baby up by the *legs* and gently smacking its back, get the patient at once to a hospital, as such foreign bodies require skilled treatment for their removal.

Under the Skin.—*Needle.*—If a needle breaks off, leaving part of itself embedded under the skin, take the patient *and the broken piece of needle* to a doctor.

If the needle is embedded near the elbow, wrist, or finger-joint, paint the place with tincture of iodine, apply a dressing and support the part in a sling. If the needle is near a joint of the leg, dress the place as above, but do not let the patient walk until a doctor has seen the case.

Thorn or Splinter.—If visible, a thorn or splinter can generally be extracted by means of a clean sharp needle. Enlarge the opening in the skin, and a little manipulation will enable the foreign body to be withdrawn.

If the thorn is not visible, bandage the part tightly and hold it above the head for 5 to 10 minutes to render it bloodless. Then shave away the hard skin round the puncture with a sharp knife or razor until the end of the splinter or thorn is visible and can be withdrawn. If this is impossible, consult a doctor.

Fish-hook.—On account of its barb, do not attempt to draw the hook back. Try to work the point on and out through the skin in a second place. Then snip off the barb with a pair of pliers or stout scissors and withdraw the hook the way it entered. Or cut off the dressing so that only metal remains and push the hook on and out.

In either case apply tincture of iodine before and after. If the hook is deeply embedded, go to a doctor without delay.

FRACTURES.—A fracture is the technical term for a broken, cracked, or splintered bone, and is the result of violence of some sort.

When a fracture occurs at the spot where violence was applied, the fracture is said to have been caused by *Direct Violence*, e.g. a cart-wheel going over the leg and breaking a bone, or a blow on the head which fractures the skull.

When a bone breaks at some distance from the site of the injury, the fracture is said to be due to *Indirect Violence*, e.g. a fall on to the outstretched hand may break the collar-bone.

Occasionally a sudden violent contraction of a muscle fractures the knee-cap or

tears off a bony point. Such fractures are said to have been caused by *Muscular Action.*

There are various kinds of fracture.

1. **Simple.**—In this case the bone is broken, but not the skin. There is a minimum of injury to the surrounding tissue.

2. **Open or Compound.**—In a compound fracture the skin and surrounding tissues are torn, and there is communication between the outside air and the broken ends of bone. Sometimes these ends protrude, or the wound leads down to the fracture, as when a bone is broken by a bullet.

3. **Complicated.**—A fracture is termed complicated when, in addition to the fracture, there is injury to an important blood-vessel, nerve, or internal organ, e.g. a fractured rib may pierce the lung, or, in a broken upper arm, the fractured end of the bone may cut a main nerve and paralyse the muscles of the lower arm and hand.



Emergency Splint for Fractured Humerus

Note.—A fracture originally simple may become compound or complicated if patient or attendant move the part carelessly and the ends of the bone get separated.

Fractures are also classified according to type of injury to the bone.

When the bone is broken into several pieces, the fracture is termed "comminuted." Such fractures need especial care in handling.

Owing to the softer state of the bony tissues in children, a bone may bend and crack without breaking completely. This type of partial fracture is termed "greenstick."

When the ends of a broken bone are driven into each other, the fracture is termed "impacted."

General Signs and Symptoms of Fractures.—In many cases a fracture is self-evident, but it is not always so. Therefore inquire of the patient or onlookers the nature of the accident. Note any tears or mud marks on the clothing and ask if the snap of a bone was heard or felt.

Some, but not necessarily all, of the following symptoms occur in every fracture.

1. *Pain* at or near the seat of the fracture.

2. *Loss of power* in the limb. (*N.B.*—Though impaired function strongly suggests fracture, continued power to use the limb does not exclude fracture entirely.)

3. *Swelling* of the tissues round the seat of the injury.

4. *Deformity.*—The limb is misshapen, and below the suspected fracture it assumes an unnatural position. Owing to the broken ends overlapping each other, shortening of the limb may occur.

5. *Discoloration.*—Bleeding within the limb may cause discoloration soon after the injury.

Only a doctor should ascertain:

6. If there is unnatural mobility of the limb at the seat of the injury.

7. If a bony grating (crepitus due to the broken ends moving upon one another) can be felt or heard.

These last two symptoms will be absent in greenstick and impacted fractures.

As the object of First Aid treatment is to prevent any aggravation of the damage already done, in all doubtful cases proceed as though the existence of a fracture had been established.

General Rules for First Aid Treatment of Fractures.—All cases of fracture must be attended to by a doctor as soon as possible. Meanwhile the following First Aid treatment should be given:

1. No matter how crowded the street or how near at hand a more convenient or comfortable place, treat the fracture *on the spot.*

2. When there is bleeding (hæmorrhage), attend to this first. (*See also* BLEEDING.)
3. Steady the injured limb.
4. Treat for shock.
5. Look about for articles from which to improvise splints, bandages, etc.
6. Very gently and tenderly place the limb in as natural a position as possible.
7. *Expose the injury* by cutting open the clothes, and, if the fracture is compound, remove them. Otherwise leave them to act as additional padding for the splints.
8. *Apply splints and bandages.*—Splints are used to keep the limb at rest. This prevents further damage to the soft tissues and relieves pain. Splints must be firm enough to support the limb and long enough to pass beyond the joints immediately above and below the fracture. They must be padded to fit, as far as possible, the contour of the injured limb, and should be applied over the clothing. They may be improvised from walking-sticks, umbrellas, police truncheons, broomsticks, tightly rolled newspapers or maps, straw bottle covers, etc. etc.

If no suitable article is to hand, a fractured arm may be tied to the body without splinting. In all cases a broken leg should be bound to its fellow in addition to being splinted.

Bandages must be firmly applied, yet not so tightly as to impede the circulation. As far as possible they should be passed under the body or limb in the natural hollows, such as the small of the back or behind the knee. Do not lift a fractured limb in order to bandage it. Push the bandage under the limb with a piece of stick or cardboard.

9. Never attempt to remove a case of fractured leg, spine, pelvis, or skull except on a stretcher.
10. As an anæsthetic is likely to be given for the setting of the fracture, it is advisable not to give the patient food.

Special Fractures. *The Skull.*—A fracture of the dome is usually caused by direct violence, such as a blow on the head or a fall from a height.

A fracture of the base is usually the result of indirect violence, such as a fall on the feet or a heavy blow on the jaw.

In both cases the patient is generally unconscious.

Signs of a fractured dome are injury to the scalp, swelling, and sometimes depression of the bone.

Signs of a fractured base are bleeding from the ear, mouth, or nose and no visible scalp injury.

The danger lies in injury to the brain, and medical aid must be sought at once. Therefore as soon and as carefully as possible transport the injured person home or to a hospital. While awaiting the doctor, keep the patient quiet and warm and apply cold to the head.

The Jaw.—A fracture is generally caused by direct violence, e.g. a blow or a fall. Either or both sides of the jaw may be involved. There is pain and swelling, inability to move the jaw freely, and bleeding from the gums. The line of the teeth may be altered and the patient speaks with difficulty.

Gently press up the lower jaw against the upper; if no "four-tailed" bandage (*see also* ROLLER BANDAGES) is available, use a narrow-fold bandage or two handkerchiefs. To apply the former, place the centre under the chin and carry one end up over the top of the head and down as far as the angle of the jaw. Cross the ends and pass the longer one across the front of the chin and round the back of the neck. Tie at the side of the neck.

To apply two handkerchiefs, fold into narrow bandages. Place the centre of one bandage beneath the chin and tie on the top of the head. Place the centre of the other in front of the chin, carrying the ends back and tie behind the neck. Then tie the ends of both handkerchiefs firmly together.

The Spine.—A fracture of the spine may result from direct or indirect violence. An iron-tyred wheel passing over the back exemplifies direct violence; a broken neck resulting from a fall on the head is an example of indirect violence.

Dislocation of some of the segments (vertebræ) often accompanies a fracture of the spine. In both cases the danger lies in injury to the spinal cord or some of the nerves issuing therefrom. Such injury is likely to cause paralysis of the lower part of the body.

Treatment.—If the patient is conscious warn him not to move. Cover him up and bandage together thighs, knees, legs, ankles and feet.

If the patient is found lying on his side or face, very carefully roll him over on to

his back, and if unconscious turn the head to one side. Send for a doctor and look round for the wherewithal to improvise a stretcher.

If there is no doctor readily available, remove the patient from the scene of the accident to some near-by shelter.

Method of removal.—Improvise a rigid stretcher from a ladder and board, some planks, a door, gate or shutter, and place it close to the patient's head. If a rug or blanket is available, spread it on the ground. A helper kneels by each of the patient's shoulders, works the edge of the rug under the shoulders and gradually pulls it down beneath the hips and legs. (*Do not lift up the body* to pass the rug or blanket beneath.) Poles are now rolled up in the sides of the blanket or rug, and two helpers on each side carefully lift the patient on to the stretcher.

Failing any rug, blanket, or such-like article, open out the patient's coat and roll up each side firmly against the body. Five helpers are now needed. One supports the head and neck. One on each side grasps the rolled coat and another on each side takes a firm hold of the clothing about the thighs and legs. They lift together, slowly and carefully, keeping the body level.

When the stretcher reaches the place of shelter, the patient may be given water, tea, etc. (no alcohol), while awaiting medical aid.

The Ribs.—Direct or indirect violence may fracture a rib or ribs. If the cause is direct violence, such as a heavy blow, the fractured ends are usually driven inwards and may damage the lungs, liver, spleen or other organ. If the violence is indirect, the ends of bone are likely to press outwards and internal complications are improbable.

The principal symptom of a fractured rib is a sharp, stabbing pain on coughing or taking a deep breath. Coughing up or spitting blood, pallor of face and lips, failing pulse and "air hunger" suggest internal injury and hæmorrhage.

Treatment.—(*a*) If there are no indications of internal injury, pass two broad-fold bandages round the chest with their centres over the painful area. The second should overlap the first by half its width. Secure them on the uninjured side tightly enough to support the ribs and restrict the breathing. Support the arm on the injured side in a large arm-sling.

Failing bandages, use a towel folded to a width of about 10 inches and secure with safety-pins.

(*b*) If there are signs of injury to an internal organ, do not apply bandages round the chest. Lay the patient flat and support his body so that it inclines towards the injured side. This limits the breathing movements of that side of the chest. Loosen the clothing, give ice to suck, and place an ice bag or cold compress over the seat of the injury. Send for a doctor.

The Pelvis.—Severe crushing violence, such as the passing of a wheel over the body or a heavy fall, may fracture the pelvis or haunch bone.

The symptoms are inability to stand, great pain and difficulty in moving the lower limbs though they themselves are uninjured and pain on pressing the hips inwards.

Treatment.—Settle the patient in the position giving greatest ease, preferably flat on the back. Bend up or straighten out the legs as the patient desires. Push a broad-fold bandage in under the small of the back and work it down under the hips. Tie it tightly enough to support and keep at rest the injured parts. Place a pad between ankles and knees and bandage the legs together.

There is always considerable shock when the pelvis is fractured, so keep the patient warm and remove him on a stretcher as soon as possible.

The danger lies in possible injury to one of the important internal organs.

The Collar-bone (Clavicle).—This is a common fracture and usually due to indirect violence, such as a fall on to the shoulder or outstretched hand.

The fracture can generally be felt by passing the fingers lightly along the collar-bone. The fractured ends often overlap by about ½ an inch, the inner fragment being, as a rule, above the outer.

The arm on the injured side is partially helpless, and the patient usually supports it at the elbow with his other hand. The head leans over to the injured side.

If both collar-bones are broken, in addition to these symptoms it will be noticed that the patient has difficulty in breathing.

Treatment.—Remove the coat, uninjured arm first, and other garments as necessary. Unfasten a man's braces. Then:

1. Place in the armpit a firm, flat pad the size of a Bath bun.

2. Gently draw back the shoulder, keeping the forearm well up and resting across the chest.

3. Apply a St. John's Sling. (*See also* BANDAGES, USES OF TRIANGULAR.)

4. Pass a broad-fold bandage round the elbow and trunk. Draw in and tie the injured limb securely to the side.

5. Make sure that the pulse is present at the wrist. If not, loosen the bandage round the body.

6. Tighten the sling.

Alternative Method.—For a fracture of one or both collar-bones.

1. Place a pad in both armpits.

2. Make two rings by tying the ends of two handkerchiefs, or narrow-fold bandages if available. Pass one up over each arm so that they rest one on each shoulder.

3. Go behind the patient and pass a third bandage or handkerchief through each loop. Draw fairly tight so as to "brace back" the shoulders. Tie in the middle of the back.

4. If only one collar-bone is broken, support the arm on the injured side in a narrow arm sling. (*See also* BANDAGES.) If both are broken, fold the hands across the chest, pass a bandage round arms and trunk, and tie in front.

The Shoulder-blade (Scapula).—Fracture of this bone is a rare accident, but may result from being crushed between a vehicle and a wall or other obstacle.

It is not easy to detect, but if a severe blow has been received over the shoulder-blade and there is sharp pain and perhaps a grating sensation (crepitus) on moving the arm, treat as a fracture.

1. Remove coat, waistcoat, braces and such other clothing as is expedient.

2. Make a large pad of the waistcoat or similar garment. Place it over the injury and a soft pad in each armpit.

3. Place the middle of a broad-fold bandage in the armpit on the injured side. Bring up the ends, one across the back over the pad on the seat of the injury and the other up across the chest, to meet on top of the shoulder on the sound side. Draw them fairly tight, cross them and bring them down under the armpit and tie.

4. Support the arm on the injured side in a large arm sling.

The Upper Arm (Humerus).—Fractures of the upper arm may occur close to the shoulder, close to elbow, or in the middle of the shaft of the bone.

The latter kind are readily diagnosed, but those occurring close to the joints are not easily distinguished from dislocations.

The chief differences are:

(*a*) Fracture near the shoulder joint.

The arm moves freely and the elbow is close to the body. In dislocation of the shoulder the arm moves with difficulty and the elbow hangs away from the body.

(*b*) Fracture near the elbow.

The end of the upper fragment of bone is sharp and rough to the touch in a fracture. In dislocation of the elbow the projecting ends feels round and smooth.

If in doubt treat as a fracture.

Treatment.—(*a*) *Fracture near the shoulder joint.* (i) Bind the injured arm to the side by passing a broad-fold bandage round the upper half of the limb and tying it on the opposite side under the armpit. If the bandage is long enough, it is better to cross the ends under the armpit and tie on top of the sound shoulder.

(ii) Support the forearm in a small arm sling, which leaves the elbow free.

(*b*) *Fracture near the middle of the shaft.*

(i) Seat the patient.

(ii) Bend the forearm at a right angle to the arm and get the patient (or another helper) to hold it so.

(iii) From such articles as pieces of wood, cardboard, or folded newspapers, improvise four splints long enough to reach from the elbow to the shoulder. Pad them.

(iv) Apply these splints to the front, back, and two sides of the injured limb, taking care that no splint presses into the armpit or bent forearm. Tie them in position with two narrow-fold bandages, one above and one below the fracture, keeping the knots on the outer side.

(v) Support the wrist and hand in a small armsling.

(vi) Test the pulse at the wrist. If it cannot be readily felt, slacken the bandages round the splint.

If only two splints can be devised, fix one

in front and one behind the arm. If no splints of any kind are obtainable, bind the injured arm to the side with two broad-fold bandages.

(*c*) *Fracture near the elbow joint.*—Much swelling often attends such fractures, and it is difficult to determine the nature and extent of the injury. Therefore:

(1) If the accident happens *indoors*, lay out the limb on a pillow in the most comfortable position. Apply ice or cold compresses to the injured part and send for a doctor.

(2) If the accident happens *out-of-doors*, the limb should be splinted before removing the patient.

(i) Take two flat, thin pieces of wood, one long enough to reach from the armpit to the elbow, the other from beyond the elbow to the finger-tips. Cross the splints near one end, tie them together to form a right angle and pad them.

(ii) Bend up the forearm and apply the splint to the side which shows least injury.

(iii) Secure by four narrow-fold bandages; two round the upper arm, one round the forearm and one round the wrist.

(iv) Support the whole arm in a large arm sling.

(v) On reaching home remove the splint and treat as if the injury had occurred indoors.

If no splint is available, take two complete unfolded newspapers. Fold them over lengthways to make two long pads about 6 inches wide by 2 feet long. Bend them at right angles in the middle and place one behind the arm and below the forearm, the other down the front of the arm and along the upper surface of the forearm. Tie them in position and place the arm in a large sling.

The Forearm.—The forearm contains two bones—the radius and the ulna; either or both may be broken. Such fractures are caused by direct or indirect violence, such as a blow, a fall on the hand or forearm, or by a back-fire when cranking a motor-car.

When both bones are broken, the general signs and symptoms of fracture are present. When one bone only is broken, there is pain, partial loss of power, and swelling.

Treatment.—Two splints are needed, one rather longer than the other. To prevent the bones being pressed together, the splints should be slightly wider than the broadest part of the forearm.

(*a*) Bend the elbow to a right angle and lay forearm across the body, thumb uppermost.

(*b*) Pad the splints and apply the longer to the palm of the hand and inner surface of the forearm, so that it reaches from beyond the elbow to beyond the finger-tips. Place the shorter splint on the outer surface, extending from beyond the elbow to the knuckles.

(*c*) Secure the splints with two narrow-fold bandages, one above the fracture and the other tied as a figure of 8 round the wrist and hand.

(*d*) Look at the finger-nails and see if the colour returns to them after being pinched. If it does not, slacken off the bandages.

(*e*) Support the splinted arm in a large sling

Special Fractures of the Forearm.—1. *Fracture of the Elbow Tip* (olecranon process).

The prominence at the back of the elbow is called the "olecranon process." It is the upper end of the ulna and sometimes fractures. There is pain, swelling, and discoloration at the back of the elbow. A gap may be felt below the tip of the elbow between the fragments. The arm cannot be straightened.

Treatment.—Procure a straight piece of wood, a short umbrella, some cardboard, or a folded newspaper, long enough to reach from the middle of the upper arm to the wrist. Place this along the front of the limb and secure with two narrow-fold bandages. Fix the arm to the body with another bandage.

(2) *Fracture of the Lower End of the Radius* (Colles's fracture).

This injury is caused by back-fires from motor-car starting handles and by falls on to the outstretched hand.

There is swelling and pain, with marked deformity at the wrist and a characteristic inverted-spoon like prominence on the back of the wrist.

Treatment.—If the patient can be taken quickly to a doctor or infirmary, apply a cold compress to the wrist and put the arm in a large sling. Otherwise, splint as for a fracture of the shaft and get the patient to bed. Remove the splint and rest the injured part on a pillow until a doctor arrives.

N.B.—In this fracture the broken ends are often driven into each other (impacted).

The symptoms then are deceptive and suggest a sprain rather than a fracture. When in doubt treat for fracture.

Fracture of the Hand—Crushed Hand.— Place the palm of the hand upon a carefully padded splint reaching from the middle of the forearm to beyond the finger tips. Secure the splint with a narrow figure of 8 bandage round hand, wrist and forearm.

The Thigh-bone (Femur).—This bone is one of the strongest in the body and, especially in its upper third, is well protected by soft surrounding tissues.

Fractures of it are divided into two main classes: (i) Fractures of the shaft, and (ii) Fractures of the upper end near the hip.

Fractures of the shaft are usually due to direct violence, such as a fall from a height or a run-over accident. But the neck of the femur, especially in elderly people, is often broken by a slight fall or stumble. This is indirect violence. Such a fracture resembles a dislocation, but may be recognized by:

(*a*) Mobility of the limb.

(*b*) The position of the foot, which lies on its outward side.

(*c*) Inability to raise the foot when lying on the ground.

With a dislocated hip there is:

(*a*) Rigidity of the limb.

(*b*) The head of the bone can be felt, usually at the back of the buttock.

(*c*) The foot is turned inwards.

In both cases there is shortening of the leg.

Treatment.—This depends upon the nature of the injury and the apparatus available.

Keep the patient warm and telephone for an ambulance to bring a Thomas splint. This is a special appliance named after its inventor, H. O. Thomas, a pioneer of bone and joint surgery, and brought to world-wide fame by his nephew, Sir Robert Jones. It was used extensively during the Great War and saved countless lives and much suffering. It is, however, not a suitable appliance for "casual" first aid, but needs for its application a trained first aid unit.

Except where there is very extensive wounding of the upper thigh or buttock, against which the splint would press, the Thomas splint can be used for all fractures of the upper third of the lower leg, the knee and the thigh.

If no hospital or ambulance is within call, proceed as follows:

1. *For a Fracture of the Lower Two-thirds of the Shaft.*—Procure a straight piece of wood, such as a broom, long enough to reach from the patient's armpit to beyond the sole of the foot. Lay the patient on his back and gently straighten out the leg. If there is marked deformity at the fracture or shortening of the leg of two inches or so, take hold of the foot and draw it gently down till it corresponds with the sound limb. Do this very gently, and stop if it causes severe pain. Get an assistant to hold the foot in the corrected position.

Arrange some padding and lay the splint along the outer side of the body and leg from the arm-pit to beyond the heel. If a second, shorter splint is available, place it on the inner side of the leg from the fork to the heel. Failing this, after splinting the injured leg, tie the sound one to it.

Seven bandages are needed. The *first* holds the foot to the splint and both feet together. Slip it under both ankles and take a turn round the splint. Cross the ends over the instep and pass them figure of 8 fashion round feet and ankles. Tie off under the soles of the feet.

The *second* holds the splint to the chest. Slip the bandage beneath the small of the back and slide it upwards to the level of the armpits. Take a turn round the splint, pull firmly and tie the ends over the splint.

The *third* holds the splint to the hips. Slip the bandage under the small of the back and slide it downwards to the broadest part of the hips. Take a turn round the splint and tie tightly over the outer side of the splint.

The *fourth* and *fifth* hold the thigh to the splint above and below the fracture. They are pushed under the limb and worked into position.

The *sixth* goes round both knees and both splints, holding them firmly.

The *seventh* encircles the leg midway between knee and ankle.

If no splint at all is available, bind the two legs together with handkerchiefs, ties, belts, etc. Place one at the top of the thighs, another just above the knees, a third below the knees, and a fourth binding feet and ankles.

2. If the fracture occurs in the ***Upper Third of the Bone*****, though the above treatment is permissible, it is better to apply short**

splints and to support the leg in a flexed position.

Four stiff splints are required, and after application the legs are bandaged together and the patient placed flat.

The Knee-cap (Patella).—A fracture of the knee-cap may be caused by direct violence, but is more frequently due to muscular action. For example, if the foot slips, the front muscles of the thigh contract with such violence that in the attempt to recover balance the knee-cap sometimes snaps across.

The symptoms are pain, swelling, loss of power and a gap which can be felt between the upper and lower fragments of bone.

Treatment.—(i) Put the patient on his back and support the head and shoulders.

(ii) Straighten the leg and support the heel about 12 inches from the ground on an upturned bucket, bricks, etc.

(iii) Apply a splint along the back of the limb from the edge of the buttock to the heel.

(iv) Apply three bandages. (*a*) Place the centre of a narrow-fold bandage against the sole of the foot. Cross the ends over the instep and pass them round behind the ankle and splint. Cross and bring them forward again and tie off in front of the ankle or beneath the sole. (*b*) Pass a broad-fold bandage round the middle of the thigh to secure the upper end of the splint. (*c*) Place the centre of a narrow-fold bandage on the front of the thigh just above the knee. Cross the ends beneath the knee and bring them up to the front again below the knee. Pull tight and tie.

The Lower Leg.—The leg from knee to ankle comprises two bones, the tibia and the fibula. Either or both of these bones may fracture. If both break, the nature of the injury is self-evident. But when only one fractures, the unbroken bone may act as a splint and mask the damage.

In such a case there may be no deformity or shortening of the limb, the only symptoms being pain, swelling and discoloration. Such a fracture occurring low down near the ankle is distinguished with difficulty from a sprain or dislocation. If in any doubt as to the nature of the injury, treat as a fracture.

Treatment *of a simple fracture:*

1. Steady the leg by holding the ankle and foot.

2. Apply splints to the outer and inner sides of the leg, extending from above the knee to beyond the foot. (If only one splint can be devised, place it on the outer side. If there is nothing at all which can be utilized, tie the knees, legs and feet firmly together.)

3. Five bandages are needed. The *first* holds the splint to the foot. The *second* holds the top of the splint to the thigh. The *third* and *fourth* bandages encircle limb and splint, one above and one below the fracture. The *fifth* passes round both knees and the splint. If a sixth bandage is available, tie it round both ankles and the splint.

Do not put a splint down the front of the leg, nor tie a bandage over the seat of the injury.

Treatment *of a Compound Fracture of the Shaft of the Shin-bone.*—Owing to its position just under the skin, a fracture of the tibia is often compound, or may easily become so through careless handling of the leg.

It is a common injury in road accidents.

Symptoms and Signs.—There are pain, inability to move the foot, blood on the trouser or stocking, deformity, and the foot turns outwards. When the clothing is removed, a wound is seen in the front of the leg from which blood oozes and from which a piece of bone may protrude.

1. Send for an ambulance or a doctor.

2. Cut away the clothing and expose the wound.

3. Unless you have a first aid dressing, a *clean* handkerchief, or a *clean* piece of paper to apply, leave the wound uncovered.

4. Steady the leg and draw the foot into its natural position. If the protruding bone remains out, make no attempt to push it in.

5. Apply such splints and padding as are available. If thin sticks are used, apply several on both sides of and under the leg. Tie the legs together and remove the patient to hospital as quickly as possible.

The Foot—Crushed Foot.—This injury is caused by a fall from a height or the dropping of a heavy weight on to the foot. The symptoms are pain, swelling, and loss of power.

Treatment.—1. Remove the boot and stocking. To do this, steady the foot, undo the laces and, if necessary, cut up the centre of the toe-cap.

2. Pad and apply to the sole a flat piece of board somewhat longer than the foot itself.

3. Place the centre of a narrow-fold bandage over the instep. Carry down the ends and cross them over the splint. Bring them up and back to cross behind the heel. Thence take them forward round the ankle, cross again over the instep and tie off under the sole of the foot.

4. Support the foot on a cushion or rolled-up coat.

FROSTBITE.—Exposure to extreme cold may destroy any parts of the body which are not adequately protected. The edge of the ears, the nose, fingers and toes are most likely to suffer.

The symptoms of frostbite are numbness, a waxy appearance, and coldness to the touch.

Treatment.—Gently rub the affected part with snow or ice-cold water until sensation returns. As artificial heat causes gangrene (i.e. mortification) of the tissues, on no account bring the patient into a warm room, or the part near a fire or other source of heat until circulation is restored.

HEART ATTACKS.—There are two forms of so-called heart attack which may require First Aid.

(*a*) **Angina Pectoris.**—This is a grave disease of the heart. It affects chiefly men past middle life. The onset is sudden, generally during exertion, and there is acute pain in the region of the heart and down the left arm. The face is pallid and breathing limited.

Treatment.—(i) Prevent the patient falling.

(ii) Loosen any tight clothing about the neck and waist.

(iii) Lay the patient down. After the attack he may be raised to a sitting posture, if he wishes.

(iv) Such sufferers often carry glass capsules (holding amyl nitrite). If this is known to be so in the case under treatment, break one on to a handkerchief and hold it to the patient's nose without delay.

(*b*) Other diseases of the heart give rise to attacks associated with great difficulty in breathing.

In such cases send for a doctor and meanwhile prop the patient in a sitting position, taking care that he cannot fall face downwards on the pillows and suffocate.

INSENSIBILITY—UNCONSCIOUSNESS—FITS.—Loss of consciousness, other than natural sleep, may be partial—"stupor," or complete—"coma."

The patient can be aroused with some difficulty from stupor, but not at all from coma. In stupor the pupils of the eyes react to light, i.e. they contract in a bright light and dilate in shadow, and the patient objects to the eyeball being touched, but not in coma.

The object of First Aid treatment in cases of unconsciousness is to ensure the action of the heart and lungs and to treat the cause of the condition.

General Rules for Treating Unconsciousness.—1. Put the patient on his back, the head turned to one side. If the face is flushed, prop up the head and shoulders. If the face is pallid, raise the feet and legs.

2. Loosen the clothing about the neck, chest, and waist; send for a doctor.

3. Ensure plenty of fresh air. Open windows, keep back the crowd, fan the patient's head.

4. Treat hæmorrhage when present, but ignore minor injuries till consciousness returns.

5. Support fractures, but do not splint or bandage extensively.

6. Cover the patient with coats, rugs, or blankets to promote warmth, and remove him to any near-by shelter.

7. Give no food or fluids whatever by mouth so long as the patient is insensible. When he recovers consciousness, give sips of water. If the pulse is feeble, and provided there is no hæmorrhage apparent or suspected, give strong tea or coffee.

While carrying out these general rules, examine the patient to discover (*a*) if he is still alive, and (*b*) the cause of the unconsciousness.

Examination of an unconscious person.—1. Ascertain whether the onset was sudden or gradual, and whether it is stupor or coma.

2. Find out if the heart is beating by feeling the pulse at the wrist, temple or throat. Or place the hand over the heart. If pulse- or heart-beats can be felt, the patient is alive.

3. Watch the chest to see if the patient breathes. Note whether the breathing is quick or slow, deep or shallow, silent or noisy. Note, too, if the breath has any odour. A smell of alcohol does not necessarily mean that alcohol caused the insensibility. A stimulant may have been given or taken because the patient felt ill and he

may have become unconscious, not from the alcohol, but from whatever caused him to drink it, e.g. a feeling of faintness or the effects of poison. If intoxication is the real cause, then the patient is in a very serious state and needs skilled medical attention.

4. Examine the head for signs of injury, the ears and nose for hæmorrhage, and the mouth for blood, froth, or corrosive burns.

5. Examine the eyes. The pupils are small in *opium* poisoning and are of unequal size in brain injuries and apoplexy. They are large in (i) death, (ii) suffocation, (iii) belladonna, alcoholic and other poisoning, and (iv) shock and excitement.

6. Examine the limbs and trunk for wounds and indications of fractures or dislocations. Compare the two sides of the body. After an injury to the skull, one side may be limp and the other stiff.

7. Place the back of the hand against the patient's bared chest and note whether the skin is hot, cold or normal.

Early Signs of Death.—These are: (i) Complete cessation of breathing and heart action; (ii) the body cools; (iii) the eyes become dull and soft; (iv) the skin becomes pallid and hard.

For the purposes of treatment, cases of insensibility when breathing is present are divided into two main classes:

A. When there are no convulsions.

B. When convulsions are present.

A. **When there are no Convulsions.**

1. *Insensibility due to Head Injuries.*

(*a*) *Concussion* of the brain, or stunning, is a jarring of the brain which disturbs its functions. It may be caused by a blow, or a fall on to the head, feet, or lower spine.

The patient lapses at once into stupor, which may pass off quickly or deepen into coma. The face is pale, the breathing shallow, the pulse fast and feeble.

(*b*) *Compression* of the brain is due to pressure on the brain by a blood clot or a piece of fractured bone, and is a very serious condition. It may arise from the same causes as concussion, by which it is frequently preceded. The face is flushed, the pulse slow and full, the pupils are of unequal size, and the breathing is deep and slow.

N.B.—In concussion the symptoms are immediate; in compression they may not appear until some hours after the accident.

Treatment.—Apply the general principles for the treatment of unconsciousness. Dress the wound, if one exists, and apply ice or cold water to the head continuously.

2. *Insensibility due to constitutional causes.*

(*a*) *Shock, collapse, and syncope* (fainting). Shock is a depressed condition of the nervous system arising from and immediately after injury, hæmorrhage, or an accident. It may pass off quickly, endure, or develop into collapse.

The symptoms of collapse are stupor, pallor, rapid and feeble pulse, cold and clammy skin with sub-normal temperature.

The first aid treatment should be preventive, that is to say, whoever is rendering first aid must treat for shock and thus guard against collapse.

Preventive Measures.—(i) Remove patient from scene of accident. (ii) Loosen tight clothing, promote warmth by covering the patient with extra clothes, rugs, etc. (iii) If conscious and there are no internal pains, give some hot tea or coffee.

Fainting (syncope) arises from an insufficient supply of blood to the brain, due to weakness of the heart's action. It may be brought on by physical causes, such as hunger, fatigue, or tight clothing; or by such mental causes as fear, bad news, or sudden relief from a state of prolonged suspense.

The symptoms are pallor, shallow breathing, feeble pulse, limpness, stupor, and a cold, clammy skin.

Treatment.—Aid the return of blood to the brain by keeping the patient horizontal. Provide circulation of air. Loosen tight clothing about the neck and chest. Apply smelling salts to the nose, or sprinkle the face with a little cold water. Rub the hands and feet and apply warmth to the pit of the stomach.

When consciousness returns some hot coffee or a little brandy may be given.

Guard against a relapse by resting and maintaining body warmth.

(*b*) *Apoplexy* ("stroke"). This is a disease, not an injury. In elderly people the arteries lose their elasticity and tend to become brittle. An artery in the skull may then rupture and blood flow out over the brain, causing unconsciousness.

Symptoms.—(i) The patient is elderly (ii) The face is flushed. (iii) The breathing is loud, stertorous, and slow. (iv) The pulse

is strong and regular. (v) There is usually some degree of paralysis over one-half of the body. (vi) There is no apparent injury to the skull, no hæmorrhage from the mouth or ears.

Treatment.—Keep the sufferer on his back and slightly raise the head and shoulders. Loosen the clothing, provide a free circulation of air, give no stimulants, and send for a doctor. If it is necessary to move the patient, do so as gently as possible. Ice packs or cold cloths may be applied to the head.

(*c*) *Sunstroke* or *Heatstroke.*—Exposure to the intense rays of the sun or to excessive heat, as in a steamer's stokehold, may bring about insensibility. The symptoms are flushed face, dry hot skin, quick and bounding pulse, high temperature.

Treatment.—(i) Remove the patient to a cool, shady place and strip him. (ii) Put him in a bath of cold water, or wrap him in a wet sheet and massage the whole body vigorously. (iii) If stricken far from any habitation, apply what cold water is available to the patient's spine and fan him. Rest him in the shade and if possible arrange to transport him back after sundown.

B. **When Convulsions are present.**

Convulsions are spasmodic, involuntary contractions or twitchings of the body and limbs.

1. *Constitutional causes.*

(*a*) *Epilepsy* is a disease of the brain causing a sudden and complete loss of consciousness. It commences in childhood and may persist till old age.

The usual signs and symptoms are falling to the ground, convulsions, perhaps frothing at the mouth or gnashing of the teeth, and later quiet stupor, with slow, heavy breathing.

Treatment.—Drag the patient from any source of danger, such as a fireplace or a canal bank. Remove from his vicinity light pieces of furniture or similar objects against which he might knock himself. Gently restrain the movements of his limbs. Support his head and put a pencil between his teeth to prevent the tongue being bitten. When the "fit" passes off, cover him up and encourage sleep.

(*b*) *Hysterical Fits* (hysteria).—These fits occur in young people, more usually in girls, in consequence of mental excitement.

Signs and Symptoms.—The patient throws herself about, clutches at anyone or anything within reach, kicks, cries and laughs alternately. In some ways hysteria may resemble epilepsy, but complete unconsciousness is never present.

Treatment.—Speak sternly to the patient and threaten a cold water douche, and if she persists in her "fit," at once carry out the threat. If such fits are frequent, get medical advice.

(*c*) *Infantile Convulsions.*—These occur in young children. There are generally contortions and twitchings of muscles, blueness of the face, and sometimes froth at the mouth. There may be a single fit followed by some degree of unconsciousness, or a succession of fits.

Treatment.—(i) Send for a doctor. (ii) Sit the child up to the armpits in a bath of water just above body temperature for fifteen to twenty minutes. (iii) Keep a sponge of cold water on the top of the child's head while it is in the bath.

2. *Poisoning by Strychnine, Prussic Acid and certain Fungi or Berries* causes insensibility. For symptoms and treatment, *see* POISONS.

POISONS AND POISONING.—A poison is any substance of which a sufficient quantity, when introduced into the system, is capable of injuring health and destroying life.

Poisoning may be *Chronic* or *Acute.* The former kind results from small quantities of poison being taken over a long period, and is outside the province of First Aid. The latter occurs after the taking of one or more massive doses of poison, and the life of the poisoned person often depends upon prompt and appropriate first aid treatment.

Acute poisoning usually is the result of:

(*a*) An accident, such as the eating of tainted food, or the taking of medicine from the wrong bottle, or a wrong dose from the right bottle, or both.

(*b*) Attempted suicide.

(*c*) Attempted murder.

Symptoms.—Generally speaking, it is suggestive of poisoning if a healthy person is suddenly taken ill soon after taking food or drink, or when a person is found unconscious, perhaps burnt about the lips and mouth or in convulsions, with a suspicious bottle lying near at hand.

In the case of children, who are more

prone than adults to sudden illness, suspicious symptoms are vomiting, cramp of the legs and stomach, and pain in the mouth.

General Rules for the Treatment of Poisoning.—1. Send for a doctor, stating what has occurred and the suspected poison.

2. If breathing is not perceptible, start artificial respiration immediately.

3. Preserve any traces of the poison which may exist. Carefully guard any glass, cup, bottle, packet, or food which may have contained some of the poison; also the patient's vomit, if any, and stained clothing. This is of legal as well as medical importance.

4. (*a*) If the patient is conscious, can swallow, and has *no burns or blisters about the lips or mouth*, promote vomiting in order to rid the system of as much as possible of the poison. This can be done as follows:

(i) By tickling the back of the throat with the finger, a feather, or a paper spill.

(ii) By emetics, i.e. drinks which induce vomiting. Such are two teaspoonfuls of mustard or one tablespoonful of salt in half a tumbler of warm water, or two teaspoonfuls of ipecacuanha wine.

Repeat the doses every five minutes until vomiting begins.

4. (*b*) If the lips or mouth are burned, *give no emetic*. The poison was either a strong acid or the opposite—an alkali. Discover which and neutralize by administering the other. For *acid* poisoning, give repeated doses of a weak alkali such as chalk, magnesia, whitening, or ceiling plaster. For *alkaline* poisoning, give by the tumblerful a weak acid such as vinegar, lime or lemon juice in an equal quantity of water.

If it is not known which the poison was, give copious draughts of cold water.

5. Administer the proper antidote. This will counteract the poison and render it harmless.

For Acids and Alkalis, *see* paragraph 4 above. For other poisons, *see* TABLE OF ANTIDOTES (pages 750–1).

If there is no clue as to the nature of the poison, give milk, raw eggs beaten up in milk or water, beaten-up cream and flour, strong tea, or even water.

6. Treat any special symptoms.

(*a*) For shock and collapse, promote warmth and give stimulants.

(*b*) For drowsiness, keep the patient on the move.

(*c*) If the throat is badly swollen, apply hot fomentations to reduce the risk of the air passages becoming blocked, and give frequent sips of cold water.

Classification of Poisons.—Poisons are classified according to their action upon the human system and the consequent treatment to be given to a poisoned person.

There are four main groups.

Group 1. **Corrosives.**—This group comprises all the strong acids and alkalis such as (acids) vitriol or electrolyte (sulphuric acid), spirits of salt (hydrochloric acid), aqua fortis (nitric acid), salts of lemon (oxalic acid), used to clean straw hats, etc., acetic acid, carbolic acid, creosote, and lysol ; (alkalis) lime, caustic soda or potash, and ammonia.

These poisons stain, burn, and eat into the tissues of the mouth, throat, gullet and stomach, causing intense pain, suffocation, and collapse.

Treatment.—In general no emetic can be given, as the spasm of vomiting might rupture the wall of the stomach, if already corroded, with very serious results. For *oxalic acid* an emetic *may* be given, followed by a weak alkaline solution.

In all cases dilute at once by giving water, after which for carbolic acid, creosote, and lysol give 2 to 3 tablespoonfuls of Epsom or Glauber salts, if readily available. Otherwise, and for all other corrosive acid poisons, neutralize by giving weak alkaline solutions as described in General Rules for Treatment 4 (*b*).

For alkaline poisoning, dilute at once by giving water; if possible neutralize by adding a weak acid as described above in General Rules for Treatment 4 (*b*).

Group 2. **Irritants.**—This group comprises poisonous salts, such as the arsenical derivatives found in weed-killer, rat poison, many colouring substances, etc.; the lead compounds found in paint, hair dye, etc.; mercurial salts used in photography and as disinfectants; copper, phosphorus found in rat poison and matches, paraffin, petrol, and iodine.

Also included as irritant poisons are poisonous berries, poisonous fungi such as toadstools, and tainted food.

Such foods as meat and fish pastes, pork

pies, high game, tinned food, etc., are liable to be bad, and if so the eating of them may cause *ptomaine* poisoning or "botulism." If several persons who have partaken of the same food later develop the same symptoms of colicky pain and diarrhœa, ptomaine poisoning is probable.

Symptoms.—All these poisons irritate and inflame the stomach and intestines, causing retching, purging, colicky pains, and ultimately suffocation and collapse. In iodine and food poisoning there is also great thirst.

Treatment.—If able to swallow, give an emetic. Dilute the poison by giving water, tea, or milk in abundance. Keep the patient warm and give beaten-up eggs or, *except in phosphorus poisoning,* salad oil.

In *iodine* poisoning give starch and water.

N.B.—Phosphorus dissolves in oil, and in this form is more readily absorbed into the system. Therefore never give oil in a case of phosphorus poisoning.

Group 3. **Narcotics.**—This group comprises the sleep-producing drugs such as *chloral, veronal,* and various headache powders; *opium* and its derivative *morphia,* found in laudanum, paregoric, Dover's powder, chlorodyne and many soothing syrups.

Unlike the Corrosives and Irritants, these substances do not directly affect the tissues, but are absorbed into the blood and then act upon the nervous system. They produce drowsiness leading to stupor and insensibility.

Symptoms.—The features are generally pale, the pulse slow, the breathing slow, deep and noisy. The breath smells musty and the pupils contract to "pin-points."

Treatment.—If the patient is able to swallow, give an emetic followed by two tablespoonfuls of Condy's fluid, or enough crystals of permanganate of potash to cover a sixpence, in a glass of water. Keep the patient awake by walking him about, flicking his face and chest with a wet towel, and give him plenty of strong black coffee.

If the patient is unconscious, give nothing by mouth, as he cannot swallow. Keep him lying down with one shoulder raised until the doctor arrives, and be ready to give artificial respiration at once if his breathing shows signs of stopping.

Group 4. **Deliriants or Narcotic-irritants.**—This group comprises a number of poisons possessing the qualities of both Irritants and Narcotics. They irritate the tissues with which they come in contact, as well as reacting after absorption upon the nervous system. Thus they first produce delirium or convulsions, then coma.

The principal poisons in this group are:

(*a*) *Belladonna* and *Atropine,* found in certain liniments and eye-drops. The symptoms are wild excitement, dry, parched mouth and lips, great thirst, widely dilated pupils, delirium and coma.

Treatment.—Give an emetic at once. Combat drowsiness and give strong hot coffee.

(*b*) *Strychnine,* found in vermin-killer. The symptoms are a bitter taste in the mouth, widely dilated pupils, restlessness, convulsive spasms, tetanus, difficult breathing, and collapse.

Treatment.—Give an emetic before spasms commence, followed by large quantities of charcoal or wood cinders. Tincture of iodine or strong, "stewed" tea may be given.

The antidote is bromide of potassium, of which half an ounce may be administered in water by mouth or injected into the rectum at intervals of 15 minutes while the spasms last. Do not be afraid to give large doses of bromides in a case of strychnine poisoning.

(*c*) *Aconite,* found in neuralgic and rheumatic liniments and in the monkshood, or blue rocket, a common garden flower. The symptoms are a tingling of the mouth and throat which spreads to the whole body; sensation is dulled, especially sight and hearing. Breathing becomes difficult and finally the heart fails.

Treatment.—Give an immediate emetic, followed, after the vomiting has ceased, by stimulants such as strong tea or coffee, brandy, or whisky. If they are not retained by the stomach, they must be given per rectum as an enema.

Keep the patient lying down and promote warmth by hot-water bottles and by rubbing the feet and hands. Perform artificial respiration if the breathing fails.

The antidotes are 30 drops of tincture of belladonna (atropine), given by mouth or as an enema, or 20 drops of tincture of digitalis

by mouth and repeated in half an hour if necessary.

(*d*) *Prussic Acid and the Cyanides.*—These are among the most powerful known poisons and are particularly dangerous, owing to the rapidity of their action. Immediately the poison is taken giddiness and staggering set in. The eyes stare, the pulse quickly fails, the skin is cold and clammy, the breathing is slow and convulsive, and the patient may lose consciousness within two minutes.

Treatment.—This consists of stimulating the patient pending the arrival of a doctor. Instantly dash cold water on the face, chest, and spine. If the patient is still conscious, give an emetic followed by brandy. The latter may be given as an enema if necessary. Apply ammonia on a handkerchief to the patient's nostrils and carry out artificial respiration.

The antidote is atropine, and may be given as half a teaspoonful of tincture of belladonna.

Alcoholic Poisoning, or Drunkenness.—Alcoholic poisoning may be due to excessive drinking over a number of years. In this case it takes the form of delirium tremens (the "D.T.'s"), which needs medical treatment, not first aid.

Or it may result from a drinking bout by a person otherwise well. Put the patient to bed, keep him warm, and, if the case is serious, send for a doctor.

Or it may be due to a person in a feeble or starved condition taking only a moderate quantity of liquor. The symptoms are temporary exhilaration and a feeling of well-being, followed in an hour or less by drowsiness, deep sleep, and collapse.

Treatment.—Alcohol in large quantities is a narcotic poison, and on no account should a person in such case be left to "sleep it off" in a police cell. Give an emetic to get rid of any alcohol remaining in the stomach. Then give strong, hot coffee by mouth or rectum and keep the patient on the move. When he shows signs of recovery, put him to bed under warm blankets and with hot-water bottles to his feet.

Miscellaneous Poisons.

(i) *Camphor.*—This is used in liniments and similar medical preparations intended for external use only. It may be taken internally by mistake, or children may eat a moth-ball.

Symptoms.—The patient's breath smells strongly of camphor. There is giddiness, dimness of vision, and increased desire to urinate. The pulse is weak, the breathing laboured, and there may be delirium.

Treatment.—Give an emetic, followed by a dose of Epsom or Glauber salts. Stimulate by alternate hot and cold douches. Do not give spirits.

(ii) *Tobacco.*—An overdose of tobacco given as an emetic may cause nicotine poisoning. There is nausea, with vomiting, a clammy skin and blurred vision. The heart is affected and may fail.

Treatment.—Give an emetic and then castor oil. Stimulate the heart and keep the patient lying down for some time after apparent recovery.

(iii) *Colchicum, Colocynth, Ergot,* and *Nutmeg* are sometimes taken in the hope of producing an abortion. They are more likely to produce death, for medical science knows of no drug capable of procuring abortion without poisoning the patient and endangering her life.

Colchicum, autumn crocus, or meadow saffron.—Give an emetic followed by demulcent drinks—milk, barley water, or gruel. Keep the body warm and give brandy and strong tea.

Colocynth, or bitter apple.—Treat as for colchicum poisoning, but give 10 drops of the *spirits* of camphor, or 5 drops of the *essence* of camphor, in milk.

Ergot.—Give an emetic, followed by castor oil or Epsom salts and strong tea or coffee. Keep the patient warm and recumbent.

Nutmeg.—Give an emetic, and then a purgative and brandy, whisky, or strong coffee.

(iv) *Croton Oil.*—This is an intensely powerful purgative, which might be mistaken for castor oil. Or the liniment might be taken internally in error.

There is severe pain in the stomach, vomiting, and purging. The pulse is weak and rapid, the skin clammy.

Treatment.—Give an emetic, demulcent drinks, and stimulants to combat the shock. Apply warmth to the pit of the stomach to relieve the pain. If available, give half a teaspoonful of tincture of opium (laudanum).

Table of Principal Poisons and their Antidotes

Poison.	*Signs.*	*Treatment.*
Corrosive Acids		
Acetic Burnett's fluid Hydrochloric Nitric (Aqua Fortis) Sulphuric Tartaric	Lips and mouth burnt and stained. Pain from mouth to stomach.	*NO EMETIC.* Give water at once to dilute the poison. If possible add chalk, magnesia, or ceiling plaster. For the pain give oil, milk, or beaten-up eggs.
Carbolic acid	ditto	As above, but use Epsom or Glauber salts.
Creosote	ditto	
Lysol	ditto	
Oxalic acid	ditto	An emetic *may* be given, then chalk, magnesia, or plaster.
Corrosive Alkalis		
Ammonia Lime	Lips and mouth burnt raw.	*NO EMETIC.* Give water at once to dilute the poison. If possible add vinegar, lemon or lime-juice.
Potash	ditto	
Soda	ditto	
Irritants		
Antimony Arsenic	Vomiting, retching, faintness, purging, cramps.	*EMETIC.* Water, tea, or milk; beaten-up eggs, salad oil. Keep patient warm.
Cantharides	ditto	
Copper	ditto	ditto
Food, bad	ditto	ditto
Iodine	ditto	ditto (starch and water.)
Lead	ditto	ditto
Lunar caustic	ditto	ditto
Mercury	ditto	ditto
Paraffin	ditto	ditto
Petrol	ditto	ditto
Phosphorus	ditto	As above, but *NO* oil.
Narcotics		
Opium Morphia Laudanum Chloral	Sleepiness, pallor, slow pulse, slow, stertorous breathing, "pinpoint" pupils, musty breath.	*EMETIC.* Condy's fluid or potassium permanganate. Combat sleepiness. Hot coffee. Artificial respiration if breathing fails.
Chlorodyne	ditto	ditto
Conium (Hemlock)	ditto	ditto
Dover powder	ditto	ditto
Headache powders	ditto	ditto
Paregoric	ditto	ditto
Paraldehyde	ditto	ditto
Sulphonal	ditto	ditto
Veronal	ditto	ditto
Cocaine	Giddiness, pallor, rapid, feeble pulse.	*EMETIC.* Warmth, stimulants, artificial respiration.
Deliriants or Narcotic Irritants		
Atropine Belladonna Hyoscyamus	Excitement, dry mouth, thirst, dilated pupils.	*EMETIC.* Combat drowsiness, Strong coffee.
Nux Vomica Strychnine	Bitter taste, dilated pupils, spasms, difficult breathing.	*EMETIC.* Charcoal, wood cinders, tincture of iodine, "stewed tea." Large doses of potassium bromide.
Aconite	Tingling in mouth and throat. Dulled sight and hearing, difficult breathing	*EMETIC.* Stimulants, warmth, rest. Tincture of belladonna 30 drops, or tincture of digitalis 20 drops.
Prussic acid Cyanides	Giddiness, staggering, coma. Staring eyes, clammy skin.	*EMETIC.* Instant cold water, douches on face and back of neck, brandy, ammonia to the nostrils.
Digitalis	Green vomit, heart failure.	Stimulants, repose for some hours.
Alcohol	Drowsiness, deep sleep, collapse.	*EMETIC.* Strong coffee, keep moving. Later put into a warm bed.

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Acetic acid, *see* CORROSIVE ACIDS.
Aconite, *see* DELIRIANTS.
Alcohol, *see* DELIRIANTS, *also* ALCOHOLIC POISONING.
Almonds, oil of, *see* DELIRIANTS, under PRUSSIC ACID.
Ammonia, *see* CORROSIVE ALKALIS.
Antifebrin, *see* NARCOTICS, under HEADACHE POWDERS.
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Atropine, *see* DELIRIANTS.
Blue stone, *see* IRRITANTS, under COPPER.
Blue vitriol, *see* IRRITANTS, under COPPER.
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Cantharides, *see* IRRITANTS.
Carbolic acid, *see* CORROSIVE ACIDS.
Chloral, *see* NARCOTICS.
Cocaine, *see* NARCOTICS.
Colchicum, *see* MISCELLANEOUS POISONS.
Colocynth, *see* MISCELLANEOUS POISONS.
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Tartaric acid, *see* CORROSIVE ACIDS.
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Veronal, *see* NARCOTICS.
Vitriol, *see* CORROSIVE ACIDS, under SULPHURIC.
Zinc chloride, Burnett's fluid, *see* CORROSIVE ACIDS.

PULSE.—The ordinary method of feeling the pulse is to place the tips of the fingers on the radial artery at the wrist about one and a half inches above the root of the thumb.

The normal pulse-rate is about 72, but the rate varies according to circumstances.

The pulse-rate in infants is high—generally over 120. A person suffering from shock or hæmorrhage usually has a fast pulse-rate, say 120, but a feeble pulse.

PUPILS.—The size of the pupil of the eye is often an important symptom in First Aid.

Normally it is of medium size. It contracts in bright light and dilates in gloom.

Opium and its derivatives (morphia, laudanum, etc.) cause marked contraction. Atropine and belladonna have the opposite effect.

SEPSIS AND ANTISEPSIS.—Sepsis is due to the presence of micro-organisms or "germs" in a wound, and is shown by redness and the exudation of matter or pus. Sepsis not only prevents rapid healing, but the poison may pass into the blood-stream and cause *septicæmia*, or blood poisoning.

Antisepsis must always be aimed at by washing the hands, by avoiding unnecessary handling of the injury, and by the use of antiseptic solutions, such as *weak* solutions of carbolic acid, Condy's fluid, tincture of iodine, etc., which destroy germs.

SPRAINS.—A sudden wrench or twist may tear the ligaments of a joint and the surrounding tissues. If there is no displacement of bones, the injury is called a sprain.

The symptoms are swelling and pain, which increases on trying to bend the joint.

Treatment.—*For a sprained ankle:*

1. If the accident occurs *out-of-doors.*—Cut the laces and remove the boot. Place the centre of an improvised bandage (belt, tie, handkerchief, etc.) under the sole of the foot. Cross the ends over the instep, bring them figure of 8 fashion round the ankle to the front and tie tightly. Saturate with cold water, if available, to tighten the bandage and relieve the pain. On reaching home treat as an indoor accident.

2. If the accident occurs *indoors.*—Make the patient lie down on a couch or bed with

his foot supported on a cushion. Remove the boot and sock, cutting them if necessary. Send for a doctor, and meanwhile keep the foot raised and wrap it in a towel wrung out in cold water. If the pain continues, apply hot fomentations and cover up to keep in the warmth.

STIMULANTS.—As a rule, it is wiser not to give a patient alcohol after an accident until a doctor has seen the case.

Strong tea or coffee, meat extracts, and hot milk are useful stimulants to give if the patient can swallow. Or smelling salts may be held to his nose, after testing their strength. Hot and cold water sprinkled alternately on the face, warmth to the pit of the stomach, and vigorous upward massage of the limbs all have a stimulating effect.

STRAINS.—The symptoms are a sharp pain, possibly swelling and cramp, and inability to exert effort with the affected muscles. For example, a patient whose back is strained may not be able to stand upright.

Treatment.—Rest the injured part by supporting it in the most comfortable position and apply warmth.

WOUNDS.—There are four principal kinds of wound:

1. Incised Wounds.—These are clean-cut, may gape, and usually bleed freely. They are caused by a sharp instrument, such as a knife or razor. There is no injury other than the actual cutting of the tissues.

2. Lacerated Wounds.—In addition to the rupture of the skin, there is some tearing of the surrounding parts. Such wounds do not bleed so freely as incised wounds, for the blood-vessels are torn rather than clean-cut, and the blood has not so ready an outlet.

3. Punctured Wounds.—This class ranges from the prick of a thorn to a bayonet stab. A small external opening may mask deep internal injury to a blood-vessel, artery, vein or other important organ.

4. Gunshot Wounds.—These are treated as the above, according to their extent.

Treatment.—*First*, the bleeding must be controlled. In minor injuries this is easy; how to deal with severe bleeding, or hæmorrhage, is given under that heading.

Secondly, the wound must be cleaned.

Thirdly, the wound must be dressed to protect it from germs.

Fourthly, the injured part must be rested so that the healing process is not interrupted.

Cleaning a Wound.—*Minor Injuries.*—The instrument causing the wound and the skin itself are rarely free from germs. It is prudent, therefore, always to clean even a small cut or abrasion by applying tincture of iodine all over the broken surface immediately. Allow the iodine to dry and do not wash the wound at all.

Larger Wounds.—If the wound is dirty and immediate surgical aid is not forthcoming, gently wash away as much dirt as possible by flushing the wound with a weak solution of any household antiseptic, such as carbolic acid (1 tablespoonful in a quart of warm water), Condy's fluid, permanganate crystals (a pinch in a quart of warm water), Lysol, Izal, etc. If any obvious particles of dirt remain in the wound, pick them out. But do not search for foreign bodies you cannot see. Apply tincture of iodine all over the wound and the surrounding skin.

If possible wash the hands thoroughly before treating the injury. Touch the wound as little as possible, more especially if the hands are not clean. Do not disturb a blood clot.

Do not attempt to clean the wound of an open or compound fracture, nor a wound near a fracture; the surgeon will do this. Apply a dressing, or even a clean piece of unprinted paper if nothing better is available.

Dressing a Wound.—A dressing should be absorbent and sterile (germ-free), such as pieces of gauze, lint, clean linen handkerchiefs or towels, which have been baked in an oven, boiled for twenty minutes, or soaked in an antiseptic solution.

Do not touch the part of the dressing which is to be in contact with the wound. Apply the dressing by holding it by one corner and dropping it on to the wound. Then cover with cotton-wool, if available, and a bandage.

Healing of Wounds.—The ideal process is called healing *by first intention.* This can only occur if the wound is clean, the edges kept in contact, and the part rested.

If these conditions are not fulfilled, the gap gradually fills with granulation tissue and when level with the surrounding skin, a scar forms. This is called healing by granulation. It is a slower process than healing by first intention, and the scar is more evident.

THE CARE AND MANAGEMENT OF BABY



Bathing Baby. The towel, soap, etc., are all within easy reach.

BABY.—The baby at birth is from sixteen to twenty inches long and ought to weigh from six to eight or nine pounds. It is obvious that two tall parents may expect to have a long baby, whereas two short people will not be surprised if their baby is only sixteen or seventeen inches long or even less. The weight of the baby when born is no real guide to its strength and fitness, as so much may depend upon the sort of food the mother has been taking and on other factors. A small, wiry baby is better than a fat, flabby one. Girl babies are, as a rule, slightly smaller than boys and weigh about a pound less. When the baby is newly born it is not as a rule a very beautiful object. Its skin will be reddish and it may be covered with a greasy substance known to the doctors and nurses as the *vernix caseosa.* If this is difficult to remove at the first bath—and soaping alone does not remove it—gently rub with olive oil and wash again with soap. The new-born baby usually has quite a good head of hair which is generally dark in colour. This first hair invariably comes away leaving the baby "bald as a coot" as the saying is; then a new covering of soft down appears, and this hair will be much lighter in colour. If the child is going to be fair the second hair will be almost colourless, while a good deep yellow means a dark brown later on. Red hair is often difficult to distinguish on the small baby, but will usually be darker than the true blonde hair. The eyes of a young baby are very deceptive as they are almost always blue for a considerable number of months. Dark violet-blue eyes almost invariably mean that they will turn brown later on, whereas light-blue eyes may remain blue. Greys and hazel eyes will be darkish blue to begin with.

The baby in the womb has been bent over with its knees drawn up to meet its bent head, and very often the hands with clenched fists have been pressed over the eyes. It will often be found that in its first weeks of life the baby tends to return to these positions; but it will, of course, grow out of the tendency very soon, and will take the greatest delight in straightening itself out when it comes to the kicking stage.

The skull of the young baby is usually large in proportion to its face and will remain so until the baby begins to develop the lower part of its face by the exercise of its jaw in talking and eating. The two parts of the baby's skull do not completely meet until the baby is two or three months old, and soft

spaces, called the *fontanelles*, are left on the top of the head and at the back of the head. These fontanelles must be treated with the utmost gentleness when handling the child to wash it, etc. While they are still open, the pulsations caused by the heart beating can be watched, and in a fit of crying the fontanelles may bulge. The motions of a newborn baby consist of small amounts of a dark green fluid called *meconium*. This changes to light brown, more solid material, when the baby has become established on its breast-feeding or other food. A length of umbilical cord, through which the baby was nourished in the womb, remains attached to the navel of the baby for about a week after birth, when it shrivels up and drops off. The operation of tying it off will be described under CHILD-BIRTH.

The very young baby shows no interest in what is going on round about it, but it should be able to raise its head and look about and recognize colours and objects after the first two months. Hearing may develop a little earlier. The baby's first real smile is not to be expected before about six weeks, although little spasms of the muscles of the face may look like smiles. The child will cry from its earliest moment; in fact, many nurses are not content until the new-born baby has cried and they are sure it is alive, but this crying is tearless until about the fourth or fifth month. The people in charge of any particular baby will very soon learn to tell the difference between the various cries of the baby, and will be able to tell whether it is hungry, and cold with a wet napkin, or is merely showing its desire for attention and spoiling. A tired cry should always be attended to, as it is cruel to try to keep a small baby awake for the purpose of showing it off to friends when it needs sleep. The cry of an ailing baby is usually unmistakable.

Baby at Birth.—A complete account of the care of the baby in its earliest moments after birth will be given under the heading CHILD-BIRTH. The care of the baby until the mother has recovered sufficiently from child-birth to attend to it must be undertaken by someone, or the baby will be very likely to die. The midwife, nurse, or a neighbour, will usually be there to do what is necessary. The cord attaching the baby to the mother will have to be cut, and the baby lifted off the bed and placed in a warm, dry wrapping in a place of safety until it can be attended to. If the child has not breathed it will have to be made to do so. Young and inexperienced women who are about to become mothers for the first time should be warned beforehand that a newly-born baby is, as a general rule, not very beautiful to look upon, with its red skin, misshapen head and possibly a bruise or two. She need have no fear, however, that her baby is going to be a monstrosity. Even a deeply-jaundiced yellow baby will probably be pink and white in a few days. In families where there is some tiny hereditary abnormality to be attended to in the early days after birth—such as a little additional toe attached by skin which can be easily nipped off by the doctor—it is as well to give permission beforehand for anything necessary to be done, since the mother may not feel like being consulted about it while she is still in a nervous state after her confinement.

Baby's Bath.—Every baby needs a complete bath every day. The time of the daily bath must depend upon domestic circumstances. Probably just after the older children and the husband have had their breakfast is a suitable time in most families. The bath will then be over in time for the baby's second feed of the day, and the baby should sleep for the greater part of the morning and allow the mother to get on with her household tasks. The ordinary house bath should not be used for bathing children until they are at least two years old; but it is not necessary to buy a very expensive special bath, a large kitchen basin made of pulp or enamel will do quite well where economy is necessary; but of course it should be kept for the bath alone until the baby has grown out of it. If an enamel bath is used a towel should be placed in the bottom to make it warmer. Everything for the bath should be ready before the baby is undressed. The bath should be placed on the floor in a convenient place well screened from draughts, and the mother's chair should be a low one so that her lap may make a good support for the baby during the undressing and dressing performance. The temperature of the bath should be 98° to 100° F. during the first 6 months, and should always be measured with a thermometer. If no thermometer is available the water may be tested by baring the elbow and trying the water with it. The water should

feel only lukewarm to the elbow. The hand should never be used for testing purposes because it is so often in and out of water in the course of a day that it is only sensitive to a temperature that is too great for the delicate skin of a small baby. In connection with the water of the baby's bath it must never be forgotten that the only safe thing to do is to put in the cold water first and then pour in hot water to bring the bath to the required temperature. In the nurseries of the highest of the land as well as in the humblest cottage, baby's bath-time is likely to find the older children gathered round, and it sometimes does happen that a toddler will overbalance and fall into the water. If the water is cold or only warm, no harm will be done, but if it is hot the child will be terribly scalded and may die.

When the bath is ready the day-clothes should be all arranged within reach. The mother should wear a waterproof apron with a soft flannel covering. When the baby is undressed and before it is put into the bath, its eyes, nose and ears should be attended to. If the eyes are sore they will need bathing with a little soda bicarbonate in the water. The ears should be cleansed with a little wad of cotton-wool or lint screwed up so that it will go into the creases in and behind the ear. The nose should be cleansed with two more twists of cotton-wool, and the face should be sponged over with a sponge kept specially for it. No soap should be used for the face unless it is very dirty, when a special baby's soap may be used. The face should be carefully dried with a very soft towel. Two thicknesses of butter muslin make a good face towel for baby. The mouth should not be sponged out unless it is sore for some reason. Nature keeps babies' mouths clean with saliva, at any rate as long as they are being fed on the mother's milk.

If there are crusts of wax in the ear they should be moistened with a little vaseline or olive oil. They will then be ready to be removed with the twists of cotton-wool. Some women screw cotton-wool on to a match-stick, but this is a very dangerous thing to do and is quite unnecessary. The baby's head should be washed daily with a little special soap, applied with a piece of thick flannel. It should be thoroughly rinsed clean of soap and dried at once with a soft towel. If the scalp is scurfy—as very many babies scalps are—a little vaseline may be rubbed in gently, avoiding pressure over the soft parts of the skull. When the head is finished the baby is ready to be lifted into the water; the mother should support its head and shoulders well out of the water with her left hand, while she gently washes over the rest of the body with a soft cloth, or her hand. All creases of the body should be specially washed, but it is seldom necessary to put much soap on a baby's body. The knees of a crawling child and its hands are usually all that need soaping and rubbing.

When the child gets older it usually enjoys its bath and will kick out and stretch its legs in the water, and will love to splash with its hands. While this is a very delightful moment for both parent and child, the baby should never be allowed to stay longer than usual in the water and should never be allowed to splash the floor or the onlookers. If bad habits are thoughtlessly encouraged when the baby is a novelty, they may become a nuisance later on and lead to a struggle every day to get the child out of the bath, and the extra trouble to the mother of mopping up half the floor of the room where the baby has been bathed.

With the baby back on her lap, drying should be carried out as quickly as possible, taking care to avoid chills. Every place where there is a crease on the body, as at the neck, under the arms, in the thighs and between fingers and toes must be carefully dried. Some people think that a baby should be smothered in powder, but the opposite is the truth. Powder tends to block up the pores of the child's skin. A small tin of good powder should be kept handy in case of chafing, but it is far better to be very particular about the drying of the baby after its bath and not to use powder unless it is necessary. At the end of the day the baby will need another sponging without being put into a bath. "Topping and tailing" or washing of the extremities with a general sponge over on the lap will be enough.

Baby's Bed and Bedding.—During the first six months of life a healthy baby is never awake for very long at a time and the place where it sleeps, be it cot or pram, should be arranged with care. The baby should always sleep alone. A young baby is not particular about its surroundings and

will thrive just as well in a home-made cot, if it is carefully planned, as in a more elaborate affair decked out with laces and ribbons. The cradle or basket should be raised off the floor a few inches to avoid floor draughts, but should not be placed on a high table from which a fall would cause serious damage. It should not be placed in a draught or in the full glare of the sun. If the child must stay indoors to sleep, the window of the room should be open a little at the top and bottom to keep the room fresh, but wherever it is possible the child should be encouraged to sleep out of doors. Curtains and canopies are not necessary and the child will thrive better without them.

The cot should have a good hair mattress covered with a waterproof sheet and an underblanket. The baby may sleep between sheets all the year round, or between blankets in winter if they do not make it too hot; but all bedding must be well aired every day and must be kept scrupulously clean. Anything which has been wet by the baby, or on which the baby has been sick, must be washed before using again or it will smell badly. In this connection it may be remarked that slightly soiled napkins should be put in the wash and not dried and put on the child again as some people have a bad habit of doing, and nothing which is going to be put on or over a baby should be washed with any of the washing powders containing strong chemicals. If two buckets are kept in a convenient place and the soiled napkins are put in one and the wet ones in the other as soon as they are taken off, with plain water to soak them, the daily washing of napkins and baby clothes will be quickly accomplished.

Needless to say, great care must be taken that nothing damp is ever used. Everything must be bone dry. Many mothers can tell at once by pressing their cheeks to a garment whether there is any suspicion of dampness about it. Grave harm can be done by carelessness in the matter of dampness of bedding, clothes, etc. If the cot requires to be warmed with a hot-water bottle, it should be wrapped in a flannel bag and put between the under blanket and the mattress. Here, again, lives of babies have been lost through carelessness in placing a hot-water bottle which was too hot near the baby, thus burning it.

Blankets and covers should not be tucked so tightly round the baby that it cannot move and kick if it wishes to. If the baby has reached the stage when it is apt to kick off its coverings it should be dressed warmly —perhaps even in its outdoor clothes—and allowed to kick. When it becomes tired and falls asleep the mother can place a blanket over it to keep it warm.

Baby's Clothing.—During the months before the baby is born, its outfit of clothing or *layette* as it is called, must be gathered together, as practically everything will be in use within a few days of the baby's birth. It is generally considered that about a week's supply of everything should be at hand, except perhaps in the case of napkins, which are washed daily and only in very exceptional circumstances left any length of time in their soiled condition. Not nearly as much is now provided for the new baby as used to be considered necessary, and people do not hoard old baby clothes as they used to. Modern ways of living do not make it easy to keep supplies of unused garments put away in drawers, and it is quite usual for the little garments which have been outgrown by one baby to pass at once to a smaller cousin or friend.

The materials for baby clothes have not changed much, but various improvements have been made. Wool is still the most useful material, because it is warm and at the same time sufficiently porous to allow the air to ventilate through to the skin. Pure wool has, however, two disadvantages for some people. It is inclined to shrink badly and become hard and board-like if the water in the neighbourhood is not soft, and many babies' skins are irritated by it, so various mixtures have been invented of silk and wool and cotton and wool, and also cotton materials of the same open texture as wool which all do excellently for baby clothing. Closely woven materials such as cotton-longcloth and silk do not ventilate well and do not absorb moisture, so are not suitable for wear near the young baby's skin. They are used only for top garments. The modern craze for waterproof or oiled silk garments has nothing to commend it. The little extra tidiness they may provide is gained at the expense of the child's health and comfort.

A typical layette for people of moderate means will consist of four or six woollen



Feeding Baby

vests, opening at the front and tied with tapes, long sleeves for a winter baby but short elbow sleeves may be used for a summer baby. These can be easily knitted in the special soft wools provided for the purpose, or can be bought. When buying clothes for babies do not be persuaded to take the smallest size in anything. The second size is usually correct for the average baby and if garments should be slightly too large they will not cause the discomfort that too small garments will. Four binders will be needed. These should be strips of flannel, and should not be hemmed. Take half a yard of flannel and tear it from selvedge to selvedge in four equal lengths. Nothing more is required to be done to them. These binders are used to wrap round the tiny baby to support the delicate part round the navel until the cord has dropped off and the region has healed up. They should not be used after the first few weeks. Barracoats, or "barras" as they are commonly called, are long flannel coats coming below the child's feet and folding well over in front. These are fastened down one side with tapes. They are sleeveless. Four will be needed. The armholes and edges of



Correct Method of Holding Baby

barras are usually bound with silk ribbon, and they may be embroidered, but the child is more comfortable if there is no danger of its having to lie on a raised-up embroidered flower, and the barras are not worn nowadays for such a long time as they were formerly. A summer baby will probably only wear its barras for a month, when their place will be taken by flannel petticoats. Three long day-dresses and three night-dresses should be sufficient. The day-dresses should be made so that they can be cut down to short dresses later on. The night-gowns may be kept long. The day-dresses will probably be made of some such material as cotton or silk, but the night-gowns should be of soft flannel to do away with the necessity for wearing a night flannel. A woollen material night-dress and a little woolly vest are sufficient night attire for the baby, with of course, a napkin and a flannel napkin or pilch. One to two dozen napkins are required, and the baby will probably grow from a small size to a larger one before the napkins can be discarded for good. They are usually made of soft turkey towelling. A good size is 23 or 24 inches square, and they should be neatly hemmed on all four sides by hand, not machine. It will save trouble later if a few yards of butter muslin are bought and washed to be cut into small squares of 6 to 8 inches to be used as linings for the napkins and removed and burnt when the napkin is soiled. The question of long petticoats is one for the individual mother. They are not strictly necessary. If worn they may be made of tarantulle, madapolam or some form of fine longcloth. They can be shortened later. Half a dozen to a dozen bibs will be required. Useful ones are large and absorbent, while there are many varieties of ornamental ones for special occasions and out-of-door wear. Little woolly coats, jackets and coatees all have their uses for wearing out of doors. The tiny baby will need a good, warm, large shawl for a wrap when being carried out of doors, and the older baby in short clothes will need a coat of woolly cloth for wear in the perambulator. Caps and bootees are needed. In cold weather the baby's extremities must be protected from cold; though in summer he may, if it suits him, go without socks or cap.

Baby, Feeding of.—It is often said, but cannot be said too often, that the natural way of feeding a baby, that is, breast-feeding, is incomparably the best. There are excellent reasons for this:

(1) The mother's milk is the one and only food perfectly nourishing and digestible for the baby.

(2) It is *perfectly* clean and uncontaminated, which other foods, even when prepared most carefully, are not.

(3) It contains vitamins, those elements in food which are essential to health, and which are lacking in boiled, tinned, or dried milks, and infant foods.

(4) The mother passes on protective substances in her milk whereby the infant gains immunity, either partial or complete, to various diseases. Statistics show that in epidemics nearly *ten times* more bottle-fed babies die than those which are breast-fed.

(5) The exercise of sucking is very beneficial to the baby: it helps to produce a well-formed mouth and good teeth, and to prevent tonsils and adenoids.

(6) The mother's health, in all but very exceptional circumstances, is also greatly benefited by nursing her baby. The abdominal organs return to their original size more quickly and completely; she is far more likely to regain a normal figure than a mother who does not nurse.

(7) Lastly, breast-feeding is true economy. "There is no more wonderful economy than the saving of the waste of infant life and the building of strong efficient citizens." Also, in artificial feeding much time is taken in preparing the food, washing bottles, cleaning teats, etc.

There are, however, various rules that must be carried out by the nursing mother if she is to feed her child successfully. Many mothers are only too willing and anxious to nurse their babies, but owing to ignorance. after a few weeks of mismanagement they reluctantly condemn the unlucky infant to "the bottle." *It is only in very rare cases that a mother is unable to nurse her baby.* To begin well, especially with a first baby, is half the battle.

Preparation for Nursing.—The mother should prepare the nipples *before* the birth of the child (*see* PREGNANCY), and she will then have no trouble with small depressed nipples, which are very likely to soften and crack, and so perhaps lead to ailments such as the formation of a breast abscess

A nursing mother should have ordinary diet, that is, a sufficiency of good wholesome food, including fresh fruit, green vegetables, eggs, and butter or dripping. She should avoid anything known to disagree, and eat sparingly of condiments, spices and curries. Alcohol should be entirely avoided. There is no necessity to overfeed by taking extra milk, for instance; three good meals a day, with gruel or cocoa at bedtime, is all that is needed. Plenty of water, however, should be taken; it is a very good plan to drink a glass of water at every nursing period, or, better still, half an hour before.

It is most important for the health of both mother and baby for a nursing mother to have her bowels well opened daily. A tendency to constipation should be corrected before the birth as far as possible, by water-drinking, diet, exercise, and suitable aperients, and during the nursing the mother should continue to be careful. It is seldom realized that not only do the foods taken influence the quantity and quality of the milk, but medicines also affect it to a considerable extent. If the mother takes aloes, senna, or other strong purgatives, the baby will have colic and loose stools; and he dislikes milk flavoured with, for instance, cascara. The mother, therefore, should look upon diet, etc., as the correct means for avoiding constipation, and if an aperient is really necessary, liquid paraffin, which acts merely as a lubricant to the bowel, is the best to use during nursing. Salts should never be taken, as they are apt to decrease the quantity of milk. It may be laid down as a rule that if the mother's digestion and bowels are in good order, so will the baby's be, and vice versa. The occurrence of menstruation is no indication that nursing should be stopped.

The mother should have plenty of fresh air; when she is up, she should have regular gentle exercise outside every day. Walking is ideal; games should not be indulged in. She should rest for five minutes before each feed, and an hour's rest in the afternoon, lying down, is very beneficial. Lastly, she should have faith in her ability to nurse, and patience in carrying out the rules, and she will succeed.

The First Day.—On the first day the baby should be put to each breast for five minutes every six hours; on the second and following days every four hours. At first only a small quantity of *colostrum*, as it is called, is produced by the breasts. It is agreeable in taste, but is in too small quantity to satisfy the baby's hunger, so that it sucks hard, and so stimulates the production of milk. Colostrum plays a very important part in infant feeding. It is "much more digestible than milk, and it becomes gradually converted into milk as the glands become developed, thus educating the stomach in the art of digestion." The baby may have warm, boiled, unsweetened water to drink, if he seems thirsty, but nothing else unless ordered by the doctor.

The First Week.—As the milk comes in, on the third, fourth, or fifth day, the baby should be fed regularly every three or four hours. (*See below.*) The time taken should be about ten minutes at first, and when feeding is fully established, regulated by the baby's increase in weight. Many babies get sufficient in five or six minutes; others take fifteen or twenty. More than twenty minutes should not be allowed.

Opinions differ as to whether the baby should be put to one or both breasts at each feed; the golden rule is that the breast must be completely emptied each time. If the baby is allowed to half-empty the two breasts instead of "stripping" one, the mother will soon find that her supply of milk is diminishing. If she has only a little at first, the baby should certainly be put to both breasts; if too much, a little of the *first* milk, which is poorer in quality, should be drawn off, and the baby should then empty one breast. Practice will soon show how much "waste" milk should be removed.

Both mother and baby should be in a comfortable position at feeding times. The mother should, while still in bed, be turned towards the feeding side, and the arm holding the baby supported by a pillow. She should take care that the baby is not so closely pressed against the breast that he cannot breathe through the nose. In such a case he is bound to stop sucking to breathe through the mouth, and will get into the habit of air swallowing—a fairly frequent cause of vomiting in babies.

A most important rule to follow is to lift the baby up at "half-time," and also at the end of a feed, lay him against the shoulder, and *very gently* pat his back until the "wind" is *heard* to come up. "Wind" is

caused by gases formed in the stomach during digestion, but whereas in a (healthy) adult these gases are brought up unnoticed, the baby must be helped in this manner, or he will assuredly bring up not only the wind, but a large proportion of his feed a few minutes after he is put back into his cot. The consequences of neglect are failure to gain weight, constant crying from hunger, and a great deal of unnecessary changing and washing of clothes. This point is emphasized, because it is the experience of workers in Child Welfare Centres and other fields of work among children, that one of the most frequent complaints is that "baby is sick after every feed" and in the great majority of cases the condition is cured when this simple procedure is carried out.

Before each feed the hands should be washed, and the nipples carefully wiped with clean cotton-wool dipped in boiled water; afterwards, the nipples should again be washed, well dried, and a little white vaseline rubbed in. (A spirit preparation hardens the skin, but tends to cause cracks; lanolin is sometimes too softening, and renders nursing a painful process.)

The baby should not be allowed to feed too quickly, nor should he be allowed to "go to sleep" at the breast. Regular weekly weighing should be carried out, to be sure that he is getting a sufficient quantity of milk, but not too much. The weight should go up (after the first week, when there is generally a slight fall from the birth weight) quite regularly by about 4 ounces a week. At 6 months the baby should have doubled his birth weight, at 12 trebled it; slight variations, of course, do not matter. A baby whose weight goes up by jerks, or is up one week and down the next, is not healthy; in many cases he is having not too little, but too much food.

If the milk is slow in appearing, the breasts should be sponged two or three times daily with hot and cold water alternately, and massaged as the doctor will direct. If there is too much milk, part may be drawn off, or less water may be drunk.

How Often to Feed Baby.—There is a difference of opinion among authorities as to whether babies should be fed 3- or 4-hourly. The writer's view is that it is a mistake to have a hard-and-fast rule. If the baby is strong and healthy, a 4-hourly interval should be aimed at. The baby gets a longer sleep, is hungrier for the next feed, and sucks vigorously; this assists greatly in promoting a flow of milk. Also, life is made very much easier for the mother. On the other hand, if the baby is weakly, or below par in any way, he practically always makes better progress when a 3-hourly feed is given. This interval should in the fourth month be gradually lengthened till he is being fed 4-hourly. The time for 4-hourly feeds should be:—6 a.m., 10 a.m., 2 p.m., 6 p.m., and 10 p.m., and for 3-hourly feeds:—6 a.m., 9 a.m., 12 noon, 3 p.m., 6 p.m. and 9 or 10 p.m.

Whatever intervals are decided upon, these must be kept to strictly. If perfect punctuality is observed, not only is the milk punctually ready for the baby, but the baby is also punctually ready to digest the milk. After a week or two, it will be found that the baby will wake practically on time to be nursed. If he is asleep, he should be awakened for a feed; it is mistaken kindness to allow him to sleep on, just as it is to feed him every time he cries. The mother who does not feed her baby "by the clock" will not only live in a constant muddle as to meals, sleep, walks, etc., but will soon become run-down, and have a peevish, crying baby, who makes no progress, on her hands.

No night feeds should be given; the long rest does both mother and child a great deal of good. If the baby wakes up about 2 a m., as he is likely to do for the first few nights, his napkin should be changed, if necessary; he should be given a drink of warm boiled water, unsweetened; and tucked up warmly in his cot. After a very few nights, he will be found to sleep quietly from 10 p.m. to 6 a.m. On the other hand, if night feeding be once started, the baby will cause a disturbance every night without fail, and, too, he may be a poor sleeper for years.

Supplementary Feeding.—If the mother is found, after a fair trial, to be incapable of feeding her baby entirely, additional food must be given. Before this, however, a careful test weighing, over 24 hours. must be carried out; this is best done by a nurse. Even though the mother has only a small quantity of milk, this is of priceless value to the baby, and complete weaning should not be considered. The nurse will, as a result of the test weighing, be able to instruct the

mother as to how much additional food is required; it should be the same as for bottle-feeding, and should be given immediately after the breast. There is no ground for the common belief that cow's milk "disagrees with" human milk, though it may on occasion disagree with the baby.

Weaning, and Putting the Baby on the Bottle.—The ideal to be aimed at is to feed the baby on breast milk for the first nine months, and then to take four or five weeks over weaning. Gradual weaning is advised, because in this way the baby only has a small amount of artificial food to deal with at first, and so rarely gets any digestive troubles. Also, the mother's milk gradually decreases, and she suffers none of the discomfort caused if weaning is sudden. If, however, the milk still continues too plentiful, the mother should reduce the amount of fluid taken, take a small dose of salts each morning, and wear a firm bandage across the breasts. It may be necessary to squeeze out the milk by hand or with a breast pump in a few cases.

The only occasions on which early weaning is desirable are: if the mother has active tuberculosis or any other wasting disease, or if she becomes pregnant again. In these cases, weaning should be fairly rapid—taking only 15 to 18 days—for the sake of the mother.

The best way of weaning is to give a tablespoonful of modified cow's milk (*see below*) before the 2 p.m. feed, and gradually increasing the amount until the whole feed is replaced by cow's milk. Then the 10 p.m. feed is dealt with, the 10 a.m., the 6 p.m., and the 6 a.m., in that order, until in four or five weeks weaning is complete, and at each feed the child is getting eight ounces of modified cow's milk. The quantity is not increased, as by this time he is getting other foods in addition. It is best to give these feeds with a spoon, not a bottle, and to teach the baby to drink from a small cup or glass as soon as possible. Many working mothers find it more convenient to give a whole feed of cow's milk rather than make the change gradually, but this is not so good for the child.

Modified or "Humanized" Cow's Milk may be prepared thus:

To make 1 pint (20 oz.).

New milk 10 oz. Grade A Certified should be used if possible.

Cream 1 oz.

Sugar 1 oz.

Water up to 20 oz.

Some authorities advise the addition of one ounce of lime water to the above before the water is added. The cream may be natural, or "New Zealand Cream" (perfected by Dr. Truby King, and advised by many authorities), or cod-liver oil emulsion. The mother is advised to get a practical demonstration on the preparation of this food from a nurse, as it is much easier to learn from seeing and doing than from reading. Only one point will be mentioned here, as it is often missed: the heat of the food should be tested by a dairy thermometer, not by tasting. Adults have become trained to take very hot food, and would think that milk at 100° F., which is the correct temperature, was cold, so they often overheat the food.

Bottle-Feeding.—This is only employed when for any reason the baby cannot be breast-fed; a doctor's advice should in all cases be obtained. The best preparation to use is the modified cow's milk, which in a number of towns is now prepared ready for use, and which mothers attending a Child Welfare Clinic can obtain on the attending doctor's prescription. There are many slight variations on the above mixture, but the basis is practically the same.

Separated or skimmed milk, or sweetened condensed milk should never be used. Many of the patent baby foods are, though not so good as the milk mixture, quite satisfactory and are convenient if good clean milk cannot be obtained. A doctor or nurse's advice should always be obtained as to a suitable food. Sometimes several have to be tried before one is found to suit the baby; but it is strongly advised that the mother should not "chop and change" on her own account, but should follow the directions of the doctor exactly.

Baby's Bottle.—Bottles with long tubes should never be used. As soon as the baby has finished his feed the bottle and teat should be washed, first in cold, then in very hot water. The teat should be turned inside out and rubbed with salt, then rinsed. Once a day both should be boiled. They should be kept in clean cold water till the next feed.

A measure (not a spoon, because they vary in size) should be used, and the correct quantity given at each feed. Any food left

in the bottle must *never* be saved till the next feed. The times of feeding are the same as those of breast-fed babies, and the baby should be on his mother's knee, not left in the cot at feeding times.

The quantity is most readily seen by a table:

Age	Feeds	24 hours
3*	6 feeds of 1 oz. =	6 oz.
4*	6 " $1\frac{1}{2}$ " =	9 "
5*	6 " 2 " =	12 "
10*	6 " $2\frac{1}{2}$ " =	15 "
3†	6 " $3\frac{1}{2}$ " =	18 "
2‡	6 " $3\frac{1}{2}$ " =	21 "
3‡	6 " 4 " =	24 "
4‡	6 " $4\frac{1}{2}$ " =	27 "
5‡	5 " 6 " =	30 "
6‡	5 " $6\frac{1}{2}$ " =	$32\frac{1}{2}$ "
7‡	5 " 7 " =	35 "
8‡	5 " 7 " =	35 "
9‡	4 " 8 " =	32 "

* Days † Weeks ‡ Months

For the first fortnight it is preferable for the bottle-fed baby to have peptonized milk mixture, or whey mixture; or a two-grain tablet of citrate of soda should be dissolved in each milk-feed for the first month, to avoid too great a strain on the delicate digestion. Exact directions for the preparation of these will be found in the supplement called DIET AND INFANT FEEDING.

Artificially-fed babies require in addition a certain amount of uncooked fruit juice daily, the best being orange, lemon, tomato (fresh or tinned), grape; or swede or apple, grated and strained. This juice is mixed with a little sugar and warm boiled water, and given once daily between feeds, e.g. at 4 p.m. The fresh fruit juice contains a vitamin which prevents scurvy. At two months of age, half a teaspoonful is required, gradually increasing to three teaspoonfuls at six months, and six at a year.

A *premature* baby needs expert care in feeding as in every way the mother must be guided by the advice of doctor or nurse.

Overfeeding and *underfeeding* both produce troublesome symptoms; and in some cases the baby may *refuse to take* the breast. In any difficulty, the mother should always get expert advice as soon as possible.

Feeding from Six Months Onwards.—From six months onwards the baby should *gradually* be accustomed to new foods; there should be no sudden changes. Until this time the stomach, practically speaking, can only deal with milk, but as the teeth begin to come and his general activity grows, the stomach also increases its powers. By the time he is twelve months old he should be taking solid food suited to his age, having three or four meals a day only, and drinking about one pint of unmodified cow's milk. Water-drinking between meals should be encouraged, but no "pieces" allowed.

His first solid food, at *six months*, should be a hard-baked crust, which is held for him to bite. At *seven months*, the crust may be lightly buttered, or dipped in egg-yolk. A little broth, meat gravy, or egg-yolk may be added to the 2 p.m. feed. (Some children cannot take egg; it should always be given in very small quantity at first, and not "pushed" if an upset occurs. It is advisable to wait a month and then try again.) At *eight months*, groats or barley flour may be cooked and added in small quantity to the 6 p.m. feed. At *nine months* he may begin to take stewed vegetables or fruit, which should be well mashed or strained. At *ten months* the 6 a.m. feed should be stopped, and a drink of sweetened orange juice, diluted with water, given instead. Breakfast should be milk, five or six ounces, and toast or crust spread with butter, dripping, or bacon fat. The fat should not be over-cooked, as this is very indigestible. Dinner should consist of milk, six ounces, and such foods as gravy, or broth, mixed with well-mashed potato and any vegetable except onions. White fish (not fried, but cooked in milk or steamed) may be given. At tea, milk, six ounces, and bread or crust and butter, with stewed apple, honey, treacle, or jam. The juice only of the jam should be used, removing the pips, seeds, and skins. At bedtime, six ounces of milk alone is given. At this age children need more *sugar;* some books recommend one teaspoonful in each six ounces of milk; but this often "sets a child against" plain milk entirely. It is wiser to make up the sugar by giving honey, which is especially good for children, or treacle, or a small piece of good plain chocolate.

From a year onwards the diet becomes much more varied. Space does not permit of

diet sheets being given; these can, however, always be obtained from a Child Welfare Centre, or may be found in many excellent books. As the child begins to chew properly, new foods may be added to his diet until, with a few exceptions, he is having the ordinary food of the family. Each new food should be given in small quantity at first, and its effect noticed. If it upsets the child, or if he shows a decided dislike to it, it may be avoided. Mere capriciousness, however, such as refusing an egg at one meal and demanding it at another, should be firmly stopped. An excess of soft foods should be avoided since the child is much better with foods that require chewing.

Meat is not recommended until the child is two years of age, as it is difficult for him to digest. The following foods should be avoided entirely: pork; liver; kidneys; veal; tea; coffee; alcohol; condiments and spices; pastries; fried foods; and sweets, except good chocolate. They may be taken (with the exception of alcohol) in *small* quantity when the child begins to get his second teeth, but not before.

After the child is two years old the mother must use her common sense in the matter of food, keeping broadly to the lines already indicated. At this time she often fears that the child is eating too little, but if he increases in height and weight, and is full of energy, the mother may be perfectly satisfied. In any case, a child's "poor appetite" should never be discussed in front of him. The diet should be properly balanced as to protein, fat, starch, and mineral substances (*see* Supplement on DIET AND INVALID COOKERY); and meals should be *well cooked, in good variety, nicely served, and punctual.* Even quite a little child's digestion becomes *bored* with a badly-cooked milk pudding five days in the week!

In this brief summary it has been impossible to give more than the broad outlines of the feeding of infants and young children. The writer has endeavoured rather to *lay stress on important points often missed* than to repeat what is found in every "mothercraft" book, or known by every careful mother. The National League for Health, Maternity, and Child Welfare, 117 Piccadilly, London, W.1, publish several invaluable booklets on children and home subjects in general, for a few pence each; these may often be obtained from a Child Welfare Centre.

In any difficulty, the mother should *always, at once,* either see her own doctor or attend a Child Welfare Centre. A baby's welfare should not be "left to the chances of unreasoning custom, impulse or fancy." On the parents depends the health of the next generation.

Training.—The early training of the baby in control of his bowels and bladder is almost as great an obligation on a mother as it is to see that he is fed regularly. When the baby is a few days old, his napkin should be undone at regular intervals and a small chamber should be placed in contact with his buttocks as he lies on the nurse's knee. Gradually the child will learn to make use of it and the feeling of the chamber against his skin will mean "time to pass a motion" to him. By the time he is a year old it should be the rarest thing for him to dirty a napkin. Training to avoid "wetting" is a very difficult business requiring infinite patience with some children, especially boys. It must be remembered that the baby passes water practically every time it is wakened from sleep, and that it has not control enough to wait the convenience of its nurse, so if wet napkins are to be avoided, lift baby as soon as he is heard stirring in his cot, and any time he has been disturbed in his sleep. In an older child who has not been trained properly, "bed-wetting" causes great inconvenience and unpleasantness, and is often very difficult indeed to deal with. As a child will always require attention more often and urgently than a grown-up, it is as well to teach the child some discreet and delicate little sentence by which he can call attention to his needs—a whisper to his mother of some such little phrase as "may I have a tidy, or attention" or just a murmur of "tidy" or "tenny" in her ear.

Exercise and Play.—A baby is just as much in need of opportunities to exercise his muscles as are older people, and in the lives of many babies these opportunities are not given nearly freely enough. For the first two months the baby will sleep most of the time, and his exercise will be limited to opening and closing his fist over his mother's finger, trying to stretch his legs out straight when he is lying naked on her knee before bath time, and such very simple movements. But

by the time he is four months old he should be kicking lustily, and should have some time every day on a rug on the floor (screened from draughts, naturally). He will now begin to roll himself over and over, and will have to be frequently replaced on the rug. At this stage a large play-pen is useful, but should be put away again as soon as baby begins to crawl, because he should have a large space to crawl in, all over the room, and under and round furniture. If he is not allowed to crawl freely in a large space, but is being continually brought to a standstill by the bars of his cage his little nervous system is likely to suffer. When baby has once begun to crawl he will be exercising his mind just as much as his body and will be beginning to learn one of the greatest lessons in life, which is to know one's own powers and have confidence in them. For this reason, and also because it will lead to his greater safety, it is better not to snatch the baby away every time he goes near the stairs, as so many mothers do. It is far better to watch carefully and gently make him climb down the few steps he has succeeded in climbing up. A baby comes downstairs backwards, one leg at a time, and will very soon become very clever at it, and he will not climb beyond his strength if he knows that he has the downward journey to face by himself. It should hardly be necessary in these days to say that Nature is the best guide as to when a child should walk. If a child does not begin to walk of its own accord at the usual age he should be left alone for a while; then, if he really appears to be unduly backward, should be examined by a doctor. The play-pen is a great help to a child at the stage when he is learning to walk, but if he does not own one he will begin standing by pulling himself up by the leg of a chair or some such aid. Tiny falls at this stage should not be taken any notice of. Baby won't make a fuss about them, but will continue his adventures if those around him treat them as a matter of course.

Baby's Outings.—A *summer* baby will usually have its first outing before its mother is strong enough to carry it out of doors herself. If the weather is really still, warm and beautiful and the baby is strong and healthy, there is no reason why it should not be carried into the garden for a short time daily any time after it is a week old, and its cot may remain out of doors most of each day after it is a few weeks old, always providing that particular care is taken to place it well out of the draught, and where a strong sun will not beat down on the baby. At the same time the wise mother will be within reach and will be watching over the child ready to be there instantly if the child becomes alarmed. A very small thing like a fly that refuses to get off the baby's face may give the small infant a severe fright if it cries and no one comes. When the pram comes into use its chief use for the first year should be as an out-of-doors bed for the baby. Until a child is old enough to take an interest in what is going on around him there is no point in wheeling him about the streets, when he would be better staying quietly at home.

The winter baby is in a different case. It must be broken in very gently to the process of remaining any length of time out of doors. The guide as to how long the child can safely be left outside is its appearance. A warm, pink-cheeked happy child can be left outside as long as it appears comfortable, but must not be left until it begins to look cold, blue and pinched. Remember that dry cold is not nearly so bad for the baby as dampness in any form, and that a pram in the garden or yard is in the open air, whilst a pram in the corridor with the door open is merely in a dangerous draught. Fresh open air may be obtained by dressing the baby in its outdoor clothes and placing the pram by an open window, but it must be open to its fullest extent and the door of the room must be kept shut.

Baby in Motor-cars.—Moving swiftly through the air cannot be good for a very small baby; and even a child of two or three years of age will often show by uneasiness in its breathing, or being unable to keep awake, that motoring is not good for it. On the other hand, small babies in their mother's arms travel very well in trains where the air in the carriages is relatively stagnant. The general conclusion is that a small baby is better in a basket cot on the floor of the car, than exposed to the full blast of air.

With regard to long journeys in trains, it is much easier to travel with a baby less than nine months old than it is to take an active, noisy, bouncing infant of between one and two years of age for any distance.

THE CHILD WELFARE MOVEMENT

THE Child Welfare movement began as long ago as 1567, when Thomas Foster, in his "Booke of Chyldren," advised "the owne mother to nourse the owne child." It progressed slowly but surely, with occasionally a great step forward—such as the establishment of the Foundling Hospital in 1742—up to 1861, when the Manchester and Salford Ladies' Public Health Society started a health-visiting campaign. The principles of this were by means of regular visiting and instruction, to better the health conditions of the poor, especially of the babies. (*See also* INFANT MORTALITY RATE.) The example of this Society was followed in gradually increasing numbers by other towns, until at the present time the movement has spread all over the country.

Two State departments are directly concerned with Child Welfare; they are the Ministry of Health and the Board of Education. Both give grants towards the expenses of the work and the training of workers, and exert pressure on backward local authorities. This, however, now seldom requires to be done, as every year it is noticed that local authorities are assuming more responsibility, either taking over voluntary Centres or starting more municipal Centres.

There is no definite division between municipal and voluntary Centres and no uniformity of rules, but in most places excellent co-operation is found. This elasticity is all for the good of the movement, as each district can make the best use of its means, and plan best for its own special needs.

The link between the mothers and children and the Welfare Centres is the Health Visitor. The provision of *adequate* home visiting is rightly regarded as a very important, if not the most important, element in any system of maternity and child welfare. As a rule, local authorities aim at the employment of one Health Visitor to every 400 births. Each Health Visitor is given a list of the births notified in her district. She calls on the mother after the midwife or doctor has ceased to visit (the midwife generally does the antenatal visiting), and goes about every month or six weeks while the baby is small, and less often as it grows older. She continues her visits till the child is of school age, and her duties are to see that the child is being properly cared for, and that the mother is willing and able to perform the necessary duties of motherhood. She also persuades the mother to attend a Child Welfare Clinic. The Health Visitor may be whole or part time, and may, in country districts, combine health- with district-visiting, school nursing, etc.

Other workers, such as midwives, Home Helps, etc., are mentioned in the appropriate sections. Besides these, there are very many voluntary workers in all branches of Child Welfare work, trained and untrained, who are (within limits) of great help to the movement.

ANTENATAL CARE.—It was realized very soon after Infant Welfare Clinics were started that to begin treatment of the child from birth was nine months too late, and enlightened workers like Dr. Ballantyne of Edinburgh urges the need for antenatal ("before birth") care if the mother were to have a healthy pregnancy, an uncomplicated labour, and a sound, strong baby. Up to that time it was thought that sickness, headaches, swollen legs, backache, and all the other ills of *neglected* pregnancy were the invariable accompaniments of *any* pregnancy.

It cannot be said too often that such ideas are entirely incorrect. If every woman had proper antenatal care, not only would her pregnancy cease to be a nine-months misery, and become a time of increased well-being and happiness, but the very great majority of complicated labours, still births, premature births, and weakly children would cease to be. The Notification of Births and Deaths Act, 1915, requires, in addition to the notification of all children born alive, the notification of still births, i.e. of any child of seven months onwards born dead. This is usually 2·5% or 3% of the total, but in all probability many premature births are missed. This, it may be noticed, does not include miscarriages, i.e. premature births up to seven months, which are very common. It is said by authorities that for every 100

children born alive 14 or 15 have died before birth. Their mortality, therefore, is more than twice as high as the Infant Mortality Rate, which is now about 65 per 1000, or 6·5 %. "It has been estimated that if all women were under medical observation during their pregnancy, about half the antenatal deaths that now take place could be prevented, and the number of infants born premature and of feeble constitution could be much reduced."

Also, about one-quarter of the children who die in the first year of life succumb during the first week, and the deaths of most of these, and of babies who die in the first two or three months of various wasting diseases, are due to antenatal conditions, which might have been controlled or remedied by antenatal medical attention.

We have statistics showing in this way the appalling waste of life, but none to show the extent of pain and suffering and impaired health suffered by both mothers and children. A high death-rate means a high damage-rate.

It is obvious, therefore, that antenatal care is needed, and somewhat disheartening to read, in the Ministry of Health Report, 1925, that "the greater majority of women neither ask for nor receive skilled supervision during pregnancy." With increasing antenatal work on the part of the authorities skilled supervision becomes year by year within the reach of more women, if they will ask for it. Unless the mothers themselves *demand and make use of* ante- and postnatal clinics, Child Welfare Centres, etc., all the well-meaning efforts of the State, the voluntary workers, and the agitators on their behalf, will be defeated.

Up to 1914, little had been done in the way of antenatal care. The law passed in 1891 prohibited the employment of women within four weeks of childbirth, but not before; the more enlightened medical men were using their influence and working personally for it; some Friendly Societies paid a small maternity benefit, generally about 30s., to their members; and in 1911, by the National Health Insurance Act, the wife of an insured man received 30s. on the birth of her child; if she also was insured, the benefit was doubled, making 60s. in all. An unmarried woman was entitled to 30s. This has now been increased to £2; £4 in all for a married insured couple, and £2 for an unmarried mother.

In 1914 schemes (interrupted to some extent by the war, and the consequent lack of money for any constructive work) were being drawn up, which were greatly to benefit both mothers and children. They were to include: (1) the better supervision and training of midwives; (2) the provision of antenatal clinics, with home visiting for those mothers who were unable to attend a clinic; (3) better attention at the time of delivery; (4) postnatal clinics, and hospital treatment either before, during, or after the birth for any mother whose condition was abnormal in any way. Provision was to be made for advice and treatment of infants and "toddlers" either at a Welfare Clinic or Infant Dispensary; and there was to be systematic visiting of children up to school age. This comprehensive scheme is not yet fully accomplished, but the work is going on steadily.

In 1915 it became law that all births must be notified; previous to that, by the 1907 Act, it was permissive, i.e. local authorities were allowed to enforce the Act or not, just as they chose. The Births and Deaths Registration Act of 1926 requires the registration of still births and, if possible, a certificate from the doctor or midwife in attendance, or who examined the body of the child. This adds to the knowledge of the *cause* of still births, and so on to measures for their prevention.

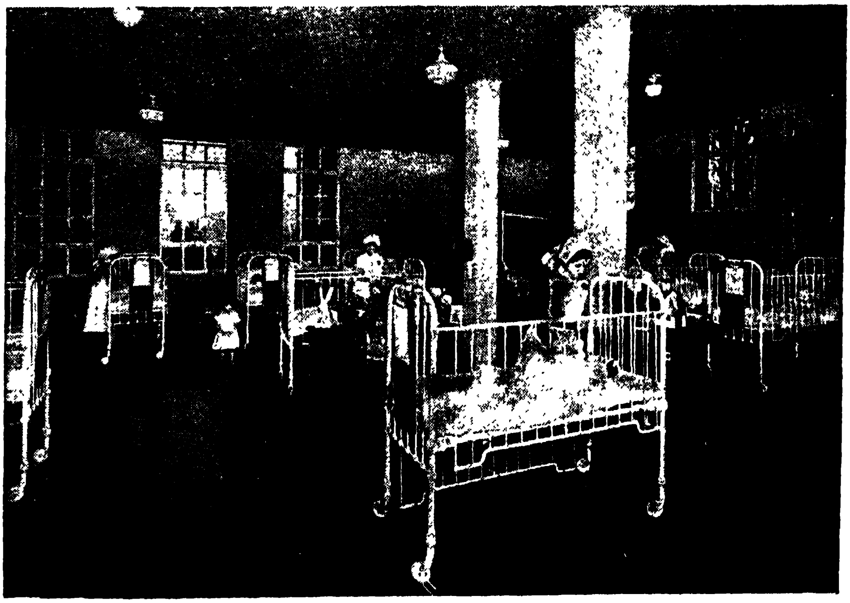
In 1918 the first Maternity and Child Welfare Act was passed, by which local authorities were empowered to adopt measures for their welfare, such as providing them with meals or milk either freely or at cost price. This was again permissive, not statutory, so that in 1925 the Ministry of Health stated that "the work varies very much, both in amount and character," but was steadily improving.

Dining Centres, which exist in London and other large towns, are very valuable. Many poor mothers are woefully indifferent to their own needs; and the expectant mother often has tea and bread in default of good nourishing food. If she has the money she often has neither the time nor the inclination to cook for herself. Dining centres supply not only the deficiency of food, but educate the mother in the use of suitable foods.

Antenatal Clinics.—At these each mother is seen privately by the doctor on duty, often a woman, who makes a careful examination and notes all necessary points. The mother is asked to attend once a month for the first six months, once a fortnight for the next two months, and each week for the last month, provided everything is normal. If any abnormality is found, she is seen as often as the doctor thinks wise, and hospital treatment offered if necessary. Many mothers prefer, either during the whole time or in the last few weeks, to be seen at home, which can always be arranged; either the midwife, or her own doctor, or in some places a specially appointed visiting woman doctor conducting the necessary supervision, while a Health Visitor also calls at regular intervals.

A confinement which is expected to be difficult should be conducted in a hospital. Home treatment in these cases is dangerous for the mother and the child, and neither doctor nor midwife can do their best if and when urgent measures are necessary. The Maternity and Child Welfare Act, 1918, gave a great impetus to the starting of Maternity Homes, both municipal and private. Sometimes they include wards for delicate babies. In 1926 the Midwives and Maternity Homes Act was passed, which "tightened up" the regulations with regard to the former, and insisted on the registration of all Maternity Homes. By this, all Homes must be inspected by the local authority, and unsatisfactory ones closed.

A Maternity Centre not only includes antenatal consultations, but general advice as to diet, clothes, etc., for the mother during pregnancy, and preparations for the confinement; also classes in the making of baby clothes, and cooking for children, etc.



[Courtesy of the Princess Beatrice Hospital

The Children's Ward in a Modern Hospital

Dental Clinics are very useful provisions, either at the Centre, or a Dental Hospital, or, by arrangement, at a dental surgeon's house. Very many mothers are found in need of dental treatment of some sort, and it is most necessary that this should be carried out before the confinement. Contrary to the old superstition, extraction of teeth does not cause miscarriages, still births, or any such sad results. Far more harm is done by keeping decayed teeth than by getting rid of them. The Ministry of Health makes a grant of 50% towards the cost of dental treatment and of artificial teeth for expectant and nursing mothers, and many Centres have

a "Dental Fund" whereby necessitous mothers are helped.

Venereal Disease.—If a mother is found to be suffering from Venereal Disease, she should have treatment. This is provided sometimes at a special Clinic, sometimes at the Maternity Centre. Treatment in antenatal cases gives admirable results. "If a woman suffering from syphilis receives adequate treatment sufficiently early in pregnancy, she is almost invariably delivered of an apparently normal, healthy child with none of the signs of congenital syphilis, whereas if untreated she either miscarries, or the baby may be still born or, if the baby is alive, it is likely to die within the first few weeks. A woman suffering from gonorrhœa needs treatment not only for the remedy of the local condition, but because the gonorrhœal discharge may give rise to puerperal infection, or lead to *ophthalmia neonatorum* in infants." (This is by far the greatest cause of blindness among infants.) The Ministry of Health pays 75% of the cost of treatment, and the local authorities the rest.

The Midwife.—Formerly, much harm was done by the ignorant untrained "handy-woman," but since 1902, when the Midwives' Act was passed, her status has risen. The Act laid down that no untrained woman should use the title of midwife, and also provided for the formation of the Central Midwives' Board to regulate the training and examination of midwives, to limit their powers, and to publish a yearly list of certified midwives. There are Inspectors of midwives, who see that their appliances are kept in good order, and who instruct them in new methods.

In the early days of Antenatal Clinics and Maternity Centres, there was practically no co-operation between the midwife and the Centre. This, however, is now largely done away with; the midwife recognizes that the development of antenatal work depends largely on herself, and many are glad to have the opportunity of going with their patients to the Centre at least once, and of having some of the antenatal care taken off their shoulders.

Home Helps.—In many cases a mother's recovery is retarded because she is worrying about her husband and children. The Home Helps Society, started in 1915, exists to find and train suitable women to cook and clean and look after the children while the mother is laid up. As regards payments, in some cases the expectant mother pays weekly into a club, and is then entitled to the services of a Help when needed, but in most cases the service is not self-supporting, and the mother's subscriptions are supplemented by private subscriptions and a government grant. The arrangements are, naturally, different in different places, but as a rule the Home Help remains for from 8 to 12 days.

When, and if, midwifery becomes part of the Public Health Service, Home Helps may become part of the Service, just as are midwives. At present, the theory seems to be the best part of the scheme. A Home Help, to be successful, must be quite an exceptional woman. Honesty and domestic capability she must possess, but what is (in the mother's eyes) as necessary, is no inquisitiveness, no criticism of the mother's method (or lack of method) and no gossiping outside.

INFANT WELFARE.—In 1918 the passing of the Maternity and Child Welfare Act gave power to the Local Authorities to assist expectant and nursing mothers, and children up to the age of five, the arrangements to be approved by the Medical Officer of Health. The State made a grant of 50 per cent. of the expenditure to both municipal and voluntary Centres, when satisfactory. In 1931, the latest year for which figures are available, the number of centres was 2,751, a gratifying increase having been noticed in every single year of the Ministry of Health records. In most areas about 50 per cent. of the children in a given area attend a Clinic, in some 70 per cent. or 80 per cent., in a few less than 40 per cent.

Each Clinic should comprise three rooms at least; a waiting, a weighing, and a doctor's room, besides a covered place for perambulators. Some Clinics are held in specially designed buildings, but the majority are held either in houses converted to the purpose, or in Church Halls, Clubs, and so on, whose premises are hired for one or two days in the week. A special building may be on a much more elaborate scale. Research work in child welfare is also carried out in such Centres, which cannot be done at a Clinic held once weekly in temporary premises.

The rooms are made as homely and attractive as possible, with a bright fire, pictures, and games for the toddlers. At many Centres tea and buns are served at cost price, so that the mothers look upon their weekly visit as a pleasant tea-party rather than an official "attendance."

The children are weighed weekly, and careful records kept of their general progress, and of advice, medicines, and the like. All children see the doctor on their first visit and, if ailing, every week until well. The healthy children are seen every few weeks, so that the doctor can watch their progress and note the early signs of falling off.

Clinics are now attended by a woman doctor, and the regulations require that the same doctor shall attend at regular intervals, usually weekly. She should have made a special study of the hygiene and diseases of children, and should notice if the child is under- or (far the more common fault) over-clothed, has a comforter, is wearing thick heavy boots instead of light shoes, and so on. In this way she greatly helps the Health Visitor, whose advice will be followed more exactly if the mothers know that the "Clinic Doctor" says exactly the same thing.

Many mothers do not know what their children may receive in the way of medical treatment at a Clinic, and are sometimes hurt because they are advised to see their own doctor or attend a Children's Hospital. Briefly, the doctor's duties are to attend to the child's health and hygiene, not to definite disease. She gives advice on feeding and general management, and minor ailments, chiefly due to faulty diet, can be treated. Some Clinics undertake the treatment of conditions such as discharging ears, or the removal of tonsils and adenoids, or (as at Bradford) have a ward for children who are not thriving, or give "sunlight" treatment, or remedial exercises, in needful cases. These, however, do not come under the heading of actual disease. Child Welfare Clinics do not and may not treat infectious diseases, a broken leg, an abscess of the ear, or serious conditions such as broncho-pneumonia, diabetes, and the like, though often asked to do so.

The doctor, if necessary, prescribes modified milk or a "baby food," or such things as cod-liver oil, malt, laxatives, and tonics. She watches a nursing mother's health, and may prescribe similar simple "pick-me-up" medicines for her. In necessitous cases a doctor may advise extra nourishment, usually milk, and signs a card for a definite amount to be given daily to the mother, or paid for at a very reduced rate. It is usual for a Health Visitor to be present at the consultations; she afterwards calls on the mothers and helps them in carrying out the doctor's instructions, and to urge *regular* attendance at the Clinic.

The mother may obtain the prescribed foods, etc., at the Clinic, where they are sold generally at wholesale cost prices. At many Clinics, also, there is a regular "shop," where feeding-bottles, tooth-brushes, fire-guards, flannel, knitting-wool, soap, mackin tosh sheeting, and even food can be bought

Except for the "milk cards" for necessitous cases, charitable relief is not often given. It has been found in the past that when the Centre becomes known as a relieving station, self-respecting mothers stay away, thus the Clinic ceases to have any real influence. On the other hand, it is one of the many duties of the Health Visitor to see that the mother has the *means* to follow the doctor's advice, and, if necessary, to put her in touch with an organization which can help her.

Some Centres hold classes for mothers, similar to those already mentioned, and arrange health talks, competitions, baby weeks, and even talks to fathers.

THE MILK SUPPLY.—In order that the milk supply should be satisfactory, several conditions must be fulfilled:

(1) The cows should be healthy, above all, free from tuberculosis, which may be passed on by drinking infected milk. Their diet should be good and plentiful, and the cow-sheds airy, light, and clean. An unhealthy cow gives poor milk.

(2) The supply should be sufficient.

(3) The milk should be clean. The question of the cleanliness of milk is a large one, and until farming is on a more satisfactory financial basis, it is quite useless for theorists to say that cows *ought* to be brushed before milking, and the teats washed, and that the milkers should wash their hands and wear a white coat. Undoubtedly these precautions *should* be taken, and are on some farms (whose owners are not

dependent on farming), but on the great majority simpler methods hold good.

The farmer, however, is far from being the only person to blame for unclean milk. Dairymen are sometimes very lax in the way they handle and store the milk; and very many housewives have the dirty habit of leaving the day's supply, uncovered, on the kitchen table. It is certainly "handy" for the housewife; it is also handy for dust, germs, and flies. Child Welfare workers have done, and are doing, much in educating people in the proper treatment of milk. It should be kept covered by muslin, in a cool airy place, if possible; and, if thought necessary, boiled or pasteurized before use. "Kill that fly" campaigns have also done a great deal of good in making people aware of the danger to milk, and all other food, by allowing flies to settle upon it.

"Dirty" milk has in the past been responsible for epidemics of scarlet, typhoid, and a fever resembling scarlet fever; also diphtheria, foot-and-mouth disease and, above all, tuberculosis. This last, however, still too often results from the use of infected milk.

Dried Milk is not so good as *good* fresh milk, but it has certain advantages. Its cost is about the same, but there is no waste and no "souring." It can be obtained in full cream, half cream, and whey grades, this being a great convenience in the feeding of delicate children and invalids. It is also easily prepared. There are many varieties, some being pure milk, some having substances added to increase its digestibility. It is also prepared in different ways, the best method being to dry the milk slowly at 70° centigrade. In this way, the milk tastes very like fresh milk, and the cream rises in the same way.

Dried milk is now sold at most Welfare Centres, but usually only to mothers advised by the attending doctor to use it for their children. It is extensively used in hot weather for infant feeding, which may be one cause of the reduction in infantile diarrhœa.

Milk Depots supply milk specially prepared and modified to suit the requirements of babies of different ages. Generally, the mother receives the prepared milk in bottles, and all she has to do is to put the bottle into hot water to warm the contents, and substitute a clean teat for the cap.

There are not very many milk depôts in this country, as they are both very expensive and very difficult to run.

THE UNMARRIED MOTHER AND HER CHILD.—That the unmarried mother and her child need protection is proved by the maternal death-rate, which is nearly twice as high as that of married mothers, and by the infantile death-rate, which is more than twice that of legitimate children. It is not difficult to guess the causes of this—concealment, lack of money, loss of employment, and an unsatisfactory "minder" for the baby. In many cases the mother is epileptic, feeble-minded, morally degenerate, or otherwise abnormal.

In some countries, illegitimate children are adopted by the State, and cared for until they are of an age to earn their own living. This, however, is open to two objections. First, the parents escape all responsibility for their child; second, the children are deprived of a home life, and are brought up in institutions. In England, by the Affiliation Orders Act, 1918, the father may be ordered to pay a maximum sum of 10s. a week towards the support of the child.

The second Bastardy Bill, 1920, gives further protection to both mother and child. By it, the mother is required to give the father's name and address when she registers the birth, so that he can be officially dealt with, and financial provision made for the child. If the parents subsequently marry, the child becomes legitimate (before this, a special Act of Parliament was necessary). All illegitimate children become wards of Court, and their welfare is properly supervised. If, for instance, the mother makes an unsatisfactory guardian, another may be appointed.

Until recently it was very difficult for the unmarried mother to keep her child, the aim of most organizations being to look after the child, so that the mother might be self-supporting. The Foundling Hospital, which came into being in 1742, exists for "the maintenance and education of illegitimate children of women previously respectable, thereby enabling the latter to earn an honest livelihood." The child is not told its mother's name, so that it is motherless as well as fatherless.

Many mothers board out their children, a usual charge being 5s. a week. Since 1931,

"all children up to the age of seven maintained for reward" are regularly seen by an Infant Life Protection Visitor (often a Health Visitor). She is required to take note of the personality of the foster-mother, the general conditions of the house and environment, the sleeping accommodation, bedding, food, clothing, education, and recreation. If a claim of adoption is made, she makes sure that this is true, as an adopted child is not visited, and an unscrupulous foster-mother may endeavour to escape inspection in this way.

It has been found that even under best conditions institutional life is harmful to young children. Infections spread rapidly, the mental growth of the children is retarded, and they do not thrive. It has been found not once, but many times, that "institution children" show a marked improvement in every way when boarded out, even though the conditions may not appear to be so good.

The most satisfactory solution is found in the provision of homes or hostels where mother and baby may be together. Special provision was made for these in the Maternity and Child Welfare Act, 1918, and there are now just over 100 Homes in existence, which provide (in round figures) for about 1,400 mothers and their babies. "These Homes admit women before the birth of the child and retain them for a varying period afterwards in order that the health of both mother and child may be established, breast-feeding practised, and provision made for the future of the mother. The average period of stay in these Homes is about 6 months." In some cases the Hostel is a permanent home. The mother is trained in domestic or other work, and when she is able, outside work is found for her, to which she goes each day. The children are under the care of a nurse while the mothers are at work.

On January 1st, 1926, the Adoption of Children Act came into force. Before that time, there was no security for anyone adopting a child; at any time a parent or other relation (unless proved to be an undesirable guardian) could claim it. On the other hand, the adopting parents might, if they chose, give up the child. Under this law, which legalizes adoption, the natural parents give up the child entirely, while the adopting parents are bound to provide for him as they would for one of their own.

There is no *one* solution—as in all social problems—for the difficult question of the unmarried mother and her child. The root of the evil lies in poor social conditions, poor education, a low standard of life and personal honour, and lack of suitable recreations. The cure lies in improving these conditions, and in giving both mother and child an opportunity to "make good" in life.

THE PRE-SCHOOL CHILD, OR "TODDLER" (2–5 years).—Until the last few years, the health of the child after he has left babyhood and before he has reached school age has been considerably neglected.

Attention being too exclusively fixed on the first year of life, it is not often realized that, though the death-rate among infants and children has shown a very gratifying decline since Child Welfare work began, there is still a very high disease rate among little children. It is found that the number of children suffering from defects and ailments at the first school medical examination remains practically constant.

There are several reasons for this occurrence of disease. The ex-baby is threatened with many new risks and dangers. He has less protection from his mother, who notices illness in a baby more quickly; he has new, and often very unsuitable, foods; he mixes with other children, and runs the risk of infectious diseases; being little and helpless, he is especially liable to accidents.

In order to maintain the child's health at a high level, and to increase his natural resistance to infectious disease, he should be just as carefully looked after as the infant. He should be well and wisely fed, get plenty of exercise in the fresh air and sunshine, and long hours of sleep. The last, which is quite as important as the others, is only too often neglected, and is bound to be where housing is bad, and overcrowding and poverty exist. Besides acute illnesses, the toddler is often found to suffer from chronic ailments, such as running ears, defective teeth, enlarged tonsils and adenoids, eye troubles, and so on, none of which will disappear without treatment, and all of which tend to cause deterioration of the child's health sooner or later. Very often, they get no treatment till the child comes under the care of the School Medical Officer.

Day Nurseries.—There are, however, various institutions which care for the young child, one of the most important being the *Day Nurseries*, formerly known as Crêches (French, crêche, a crib). They take children whose mothers have to go out to work, and look after them for the day. They are often very useful, too, to the father in cases where the mother is ill or has died.

Since 1918, Day Nurseries have been under the care of the Ministry of Health, from which they receive a grant. The other expenses are met by voluntary subscriptions, sometimes a municipal grant, and by the parents' payments, generally from 6d. to 1s. a day. The Nurseries are inspected at regular intervals.

Children are received from one month to school age. They are brought by the mother or father on their way to work, and called for in the evening. Each child is inspected on arrival by the Matron and, if found free from any signs of infection, bathed, dressed in Nursery clothes, and cared for in accordance with its age. Infants have cots, "bottles," and sleep; toddlers have three good meals, and plenty of fresh air, rest, and exercise. Their mental development is encouraged by Nursery School classes. A great point is made of the clothing and feeding at the Nursery, both for the children's sake, and as a means of educating the mothers.

The children are weighed weekly or fortnightly; and accurate records of their health kept, and seen by the Nursery School doctor, who makes a fortnightly inspection. If the child has attended a Child Welfare Centre, its previous medical record is available, and both these may be passed on to the School Medical Officer when the child reaches five, so that a complete medical record is kept.

Infant or Nursery Schools are so useful in providing a suitable environment, both physical and mental, for the toddler, that they might well be considered as a branch of preventive medicine. They are indeed, in close co-operation with Child Welfare Clinics and other public medical services.

As early as 1908 a Board of Education committee reported very adversely on the practice of admitting 3-year old children to the ordinary Elementary Schools, and laid down the conditions for suitable Nursery Schools. These were, briefly, abundance of air and sunshine, open space and hygienic buildings, opportunity for exercise and sleep, education on kindergarten lines, training in right habits, and enlightened teachers. Nothing, however, was officially done until 1918, when education authorities were empowered to supply or aid such schools for children from the age of 2 years. Their upkeep is costly, but as Sir George Newman, the Medical Officer to the Board of Education, has repeatedly urged, their value to health is such that their upkeep is more than saved in later medical care.

Even before the 1908 report, however, voluntary effort had already opened some nursery schools on kindergarten lines, which were described at the time as "centres of light and healing in slum areas." The majority were held in old adapted houses, seldom with more than a small garden attached, if any, but the results obtained were splendid. Perhaps the most famous of these was that started by Rachel and Margaret McMillan and Grace Owen, in a riverside slum in Deptford, in 1914. In these most unpromising surroundings they succeeded in creating a large nursery school run (weather permitting) on entirely open-air conditions. Their aim was "to provide the children of poor and crowded districts with something approaching the ideal nursery of their more fortunate fellows," and, within natural limits, they succeeded splendidly.

Besides these institutions for the young child who remains at home, there are also residential homes for babies and young children. They are of three kinds.

Emergency Homes exist for normal children, who on account of some domestic emergency, such as illness, cannot be cared for at home. These are few in number, and the charge is high: about 15s. per child per week; the actual *cost* being 25s. to 30s.; which in the majority is too large an amount to be spared from a working-man's wages.

Wards, Homes, or Nurseries for delicate children exist for children who are not thriving, but yet not sufficiently ill to be admitted to a Hospital. They are usually connected with a Child Welfare Centre. If it is found that, for some obscure reason, a child is not making progress, it is very helpful to put him under the observation of a trained children's nurse for a few days,

when the cause of the trouble is often found. In very many cases, it consists in unsuitable food, irregular meals, far too little sleep, and stuffy rooms, all of which are remediable if the mother will take the trouble. The various Children's Hospitals, which are too well known to need description, differ from the above in treating cases of actual disease, and surgical conditions, in children, and are run on ordinary hospital lines. There are also many Convalescent Homes in connection with the Hospitals, which are run as far as possible on open-air lines.

Permanent Homes are provided for orphans, illegitimate, and deserted children. The Foundling Hospital, established in 1742, was the first of these. The best-known voluntary institutions are perhaps Dr. Barnardo's Homes, and the National Children's Home and Orphanage, but there are very many run on similar lines. The Ministry of Health and the Board of Education also act as guardians to destitute children. These Homes care for the child and educate him, provide him with training for work, and when he is of an age to leave the Home, give him an outfit, and see that he has employment.

THE ELEMENTARY SCHOOLCHILD (5–14 years).—Thanks to the efforts of school medical officers and other untiring workers for children, the *hygiene* of school life is nowadays receiving far greater attention than it did even a few years ago.

Modern Elementary Schools.—The schools are as light and airy as possible, the tendency being to build in a wide open space and have large playgrounds. The schools are properly protected from damp, the floors non-porous, the windows large, so that the light is good, and the scholars properly placed in relation to it. (The light should come from the left side.) Classes are, many think, still too large, but considerably smaller than in former years. The classrooms are well-aired night and morning, at playtimes, and during the dinner-hour; modern buildings have in addition some system of artificial ventilation, so that the used air is constantly changed for fresh. It has been found by careful experiment that this has a great effect not only on the health of the scholars, but on their working power. Scholars doing arithmetic in a stuffy classroom get more sums wrong and work more slowly than others doing similar work where the air is pure.

A modern school is properly warmed by means of central heating of some sort, though in old buildings the open-fire system still holds good. The best method of warming, which has recently been introduced, is by means of hot-water pipes laid under a 2½-inch-thick concrete floor, which is thus maintained at a temperature of 75° to 80° fahrenheit. In this way the rooms are kept reasonably warm, but the air is not dried and overheated, as by radiators, stoves, etc.

The long forms and desks are now superseded by either a double desk and seat, shared by two scholars, or, what is best, by a separate desk-seat, with a back-rest, for each scholar. This can be adjusted as to height, so that the child is comfortable at work, and does not tend to crouch or stoop. The *perfect* desk-seat has yet to be invented, but many teachers might do more with those provided by seeing that the adjustable seats *are adjusted* for the individual scholars. In too many cases this is neglected. In infant class-rooms, small chairs and low tables are the most suitable.

Coats and hats are hung in "gangway" cloak-rooms 4 feet wide. At present these are not considered entirely satisfactory, being probably a means of spreading vermin and some infections. A 5½-foot gangway would be preferable, the distances between pegs 18 inches at least, and each child should have his own numbered peg. Metal, not wooden frames, should be used, and the cloak-rooms warmed and well ventilated.

Schools are regularly and thoroughly cleaned; in modern buildings a central vacuum cleaner is fitted. The sanitary arrangements are carefully attended to and periodically inspected. Wash-basins should be provided, one for every 25 children, and washing the hands insisted upon before school meals. Towels, one for every 50 children, should be changed each day. In some schools, washing arrangements are still very inadequate.

Lessons nowadays are shorter and more varied, and some, such as physical drill, nature study, etc., held outside whenever possible. Many schools provide a lunch of 5 ounces of pasteurized milk in small stoppered bottles, one to each child. For

this the parents, when able, are very willing to pay. The Ministry of Health in 1926 empowered local authorities to provide milk or meals for necessitous children.

No child under 12 may be employed in any capacity (except in rare cases on a farm), and no child under 14 in a factory. (*See also* FACTORIES, MEDICAL INSPECTION IN.) Thus children nowadays should have plenty of recreation and sleep.

As a result of the care of the hygiene of school-life, it is found that the schoolchild of to-day is on an average bigger, heavier, and stronger than in former years. As an example, a crippled child, once quite common, is now almost a rarity.

Medical Examination.—Since 1907, all elementary schoolchildren have been medically examined as soon as possible after their entry to the school, again at the age of 8 or 9, and in their leaving year. "Specials," i.e. children under observation, are often examined each term. There is a somewhat elaborate schedule, which must be completed by the medical officer. It includes the previous illnesses of the child, the family medical history, if this is in any way exceptional, the general and special conditions of the child; this comprises the general medical examination. Lastly, any disease or deformity is noted, and the directions for treatment given. The inspection takes place during school hours and in nearly all cases on school premises. The parents, if they wish, may be present when their child is examined.

There are many clinics for the treatment of ailments and special diseases, e.g. ear, nose and throat, teeth, and eyes. Dental Clinics have spread more rapidly than any others. Every facility is given to schoolchildren for obtaining advice as to eye conditions, and suitable spectacles when needed; and arrangements may be made at the school clinics for the removal of adenoids and enlarged tonsils. Uncleanly and verminous children are disinfected by the school authorities.

Training blind, deaf, dumb and mentally defective children.—In addition, most of the larger towns have special classes or schools for the training of blind, deaf and dumb, and mentally defective children. Where necessary, as in cases of tubercular children, or in the worse degrees of mental defect, residential schools are provided. In some places there are invalid or cripple schools, to which the children are taken by special ambulances. To these are admitted children with any chronic disease or crippling deformity which renders them unfit for ordinary school work. It is found that the children are very much happier at such a school than being merely "invalided" at home. Unsuitable cases are not admitted, such as epileptics, progressive paralytics, children with early tuberculosis of the lungs (who are sent to open-air schools), or notable mental defect. The children are trained for selected occupations requiring little physical exertion, such as designing, bookbinding, fine mechanical work, jewellery, lace-making, etc.

Ringworm and favus schools were formerly very necessary in many towns, but now, thanks to the energetic measures taken by education authorities and doctors, both these diseases are disappearing.

There is now an increasing tendency to deal with "difficult" and backward children by means of a Child Guidance Clinic, or through Social Workers, rather than to punish them, as formerly, without investigating the reasons for their "naughtiness." These methods in many cases produce a complete change for the better in a child, whereas unreasoning punishment had no good result.

Need for Co-operation.—The Ministry of Health and local medical officers and school authorities have done and are doing a very great deal to preserve the health of the nation through care of its children. What is needed now is the co-operation of the parents, not only in the discovery of *early* defects and impairments, but in the removal of such preventable conditions as uncleanliness, which causes many minor ailments (such as some skin diseases); short hours of sleep; and unpunctual and ill-prepared meals, all of which slowly but surely tend to ill-health. Parents, also, should co-operate with the school medical officers in allowing necessary treatment to be carried out. It is perhaps not well enough known that a parent who refuses necessary medical treatment for his child can be fined or imprisoned for his neglect. (*See also* INTELLIGENCE TESTS.)

BEAUTY CULTURE

IN the following articles are included all those processes which improve the personal appearance, or, to put it another way, which make it conform to the standard of beauty which is popular at the present time. Beauty Culture has been known as far back as we have any historical records, and no doubt was in existence long before that. To-day, the art is rapidly becoming a science, and beauty specialists not only use the age-old methods of "tiring the hair and painting the face," but also, to quote a recent article, "diet, exercise, electricity, X-rays, radium, gland stimulation and gland extracts, water cures, sun treatment, plastic surgery, massage, osteopathy and mental science to create health and beauty!"

HYGIENE, EXERCISES, AND FRESH AIR.—An unhealthy person, however perfectly formed her features and figure may be, can never be thought really beautiful. On the other hand, plain features may be redeemed to a great extent by sparkling eyes and a clear skin.

One should therefore correct any little errors of health as soon as possible. Constipation and indigestion are perhaps the worst foes to beauty; but any derangement of health will play its part in helping to destroy the natural good looks.

Fresh air, sunlight, and exercise are all necessary to produce the beauty of perfect health. Walking has been described as "the perfect exercise," and a brisk walk of at least half-an-hour a day is possible to almost everyone, and can be kept up practically all one's life. Games, which provide more vigorous exercise, are suitable for younger people, though some, such as golf, can be played until well on in life. Rowing and swimming are excellent exercises for the whole body, and especially good for the narrow-chested and stooping people. Cycling is good if the position is correct; also gardening, skating, and dancing (if the room is well ventilated).

If, however, it is difficult to arrange regular walks, or to indulge in games, one should make a habit of performing daily exercises. These should be done, preferably, in the morning on rising. A bathing-dress should be worn, and flat-heeled shoes, if any. The window should be open (even in cold weather one soon gets warm by doing exercises), and some people prefer to exercise to the musical rhythm of gramophone or wireless. It is more interesting to do a different "set" of exercises each morning; exercises that are performed in a half-hearted manner are not of much value. There are on the market several quite good little books on exercises for women. These not only give the ordinary type of exercise, but also movements suitable for reducing the hips, slimming the neck, and so on. After the exercises, a cold or tepid bath should be taken, and a brisk rub-down with a rough towel before dressing. Care should always be taken to hold oneself well; this will add greatly to the effect of the exercises. A good carriage is a great help in producing an impression of beauty.

One should begin easily, and gradually accustom oneself to more strenuous exercises. Severe exercise should not be taken if the breathing becomes distressed, or one is very tired afterwards. This indicates that the heart is being overworked, and this is dangerous—especially in middle age—nor should strenuous exercise be taken within two hours of a meal.

Finally, sun-bathing should be taken during the summer as often as possible, as it is an excellent means of promoting health, and of storing up vitality for the winter.

CARE OF THE COMPLEXION.—In order to care for the skin in the best way, it is necessary to know its anatomy or construction, and its functions or duties (*see* SKIN). It should never be forgotten, though it too frequently is, that the skin is a very important organ for getting rid of waste material from the body. People are too apt to think solely of the bowels and kidneys in this connection, forgetting the skin and the lungs. Each of these has its own proper work to do, and if one fails, the others invariably suffer. In this article only the skin will be discussed, and it must once again be emphasized that it is not an independent organ: if the general health is out of order, the skin will show it.

Cleanliness.—The chief requisite for a beautiful complexion can be given in one word: *cleanliness*—inside and out. (It may be noted in passing that a large proportion of skin diseases are due to lack of cleanliness alone.) "Outside" refers not only to the skin itself, but also to sponges, powder-puffs, and so on; and to any toilet preparations used. These should be of the best and purest quality. As regards inside cleanliness, any tendency to constipation or indigestion in any form should be most carefully corrected. Even a mild degree of constipation plays havoc with the complexion. (*See also* CONSTIPATION; DIET.)

With regard to the care of the skin of the face, it is not sufficient to use soap and water, or one of the innumerable and widely-advertised cosmetics, and hope for the best: the skin is as individual as the appetite; "one man's meat is another man's poison." Each person must make a study of her complexion if she desires to obtain the most satisfactory results from its care.

Types of Skins (Normal).—Skins can be roughly classified into various groups. The *normal* skin, which is so rare that it might be called the ideal, is neither too thick nor too thin, too greasy nor too dry. Minor troubles, such as enlarged pores, a red nose, and blackheads, are absent. Its care is simple. At night, a super-fatted soap (i.e. one in which is no free alkali) should be used, and the skin well washed with this and warm water, followed by a thorough rinsing to remove every trace of soap, and by a final cold rinse. In the morning a gentle massage with a clean face-cloth and warm water, followed by cold, is all that is necessary. The face should be thoroughly but gently dried. During the day, if liked, the finest rice-powder may be used. On skins that are not directly irritated by their use, powder is perfectly safe. It is almost impossible to *make* the skin absorb any foreign material, however finely divided and well rubbed-in it may be.

No cosmetic should be applied at night on a healthy skin. It is better to let the skin be free to act normally by throwing off impurities. Many a naturally beautiful complexion has been ruined by too much "creaming." During the day, especially if one lives in a town where the atmosphere is far from clean, the face may be rinsed with clear luke-warm water and re-powdered. If more convenient a cleansing lotion may be used. A simple one is: ½ oz. borax, in powder; 1 dram of tincture of benzoin; 4 oz. triple extract of orange-flower water. These should be dissolved in 1 pint of distilled water. The face should be wiped over with clean pads of cotton-wool dipped in the lotion, and re-powdered after drying. It is far more cleanly, by the way, to use cotton-wool instead of a powder-puff unless this is very frequently washed; a fresh pad should be used each time the face is powdered. All types of skin should be protected from extremes of temperature and from very rough and cold winds. There is no need to be excessively "faddy"; on the other hand, one can avoid toasting the face before a large fire, and going out immediately into a biting north-easter. The finer and dryer the skin, the more it will suffer from careless exposure.

Sensitive.—Some people have a very fine sensitive skin which will stand literally nothing in the way of cosmetics. Even soap can only be used very occasionally. These people are rare, and luckily their complexion is as a rule very good. They should be content with water alone, either naturally soft, or softened with oat- and almond-meal in equal parts, using 1 teaspoonful to the basin of water. (Borax should not be used as a water-softener, and bath-salts should be avoided, as they are sometimes only coloured and scented washing soda, which is bad for sensitive skins.) The skin, however, can be kept perfectly clean by a thorough but gentle rubbing with a face-cloth, followed by rinsing in clear cold water.

Dry.—Other people have a fine skin tending to dryness, which needs a good deal of care if it is to preserve its beauty. Any exposure makes it rough and inclined to "chap," and this is the type of skin that wrinkles at an early age unless precautions are taken. Soap should be used cautiously, and then only the best super-fatted varieties. Warm water only is used (not cold), and only at night. In the morning a creamy application should be used.

As the skin is not producing sufficient natural grease, it must be fed with fat. The best to use is natural cream, applied warm with a little wad of cotton-wool, gently rubbed in, and the excess wiped off with more cotton-wool. Cream is far milder than any artificial fat compound, and can read ly



CARE OF THE COMPLEXION

A carefully chosen skin preparation will add to the beauty of the complexion. At all times this should be lightly patted in.

be obtained by leaving milk to stand in a glass. It should, naturally, be collected afresh every day, as the acid in "turned" cream would irritate the skin. Lanoline is another excellent preparation for dry skins; or pure almond or olive oil. These last, however, are only suitable for use at night, as the shiny appearance they give is difficult to disguise. (There is a widely-spread idea that fatty preparations applied to the face cause superfluous hair to grow. This need not be feared. Superfluous hair may occur, it is true, but it is not due to any external application.)

Although it is not strictly necessary for the possessor of a dry skin to buy "special nourishing skin-foods," yet they are pleasant and convenient to use. Their perfume may vary, but their basis is always an oil of some variety. Water should if necessary be softened before use, and should not be used before going out in cold or windy weather. As a foundation, a very little cream or lanoline should be first applied, then powder, which should be of the very best quality, and used sparingly. Astringent lotions should never be used on this type of skin, or wrinkles will result; nor vanishing creams, nor cold creams, all of which are entirely unsuitable.

Greasy.—The type of skin which is inclined to be greasy, though not the most beautiful, is the easiest to look after. It occurs most often in brunettes, and indicates that the skin is thick and well-supplied with *sebum* or natural fat. It will therefore stand the passage of time best of all, and its care is simple. It may be summed up in the modern phrase: "treat it rough." At night, the face should be well washed with *hot* water, soap—which should be of good quality, but need not be super-fatted—and a washing-glove. It should, in truth, have a thorough scrubbing, though care should be taken not to pull or stretch the skin, but to work upward and outward, with a circular movement. This will remove all superfluous grease, and both clean and massage the skin. It should then be thoroughly rinsed in fresh *warm* water. Finally, the face should be well slapped all over with *cold* water to which a little eau-de-Cologne, 1 teaspoonful to the basin, may be added. This final treatment acts as an astringent, closing the pores, which tend to be large in this type of skin, and toning up the muscles. In the morning the same procedure may be carried out in a modified form; it is not wise entirely to denude the skin of natural fat before subjecting it to wind and weather. The secretion of oil, too, is apt to be increased as a natural protective if this is done. The powder may be applied directly to the skin. Do not fear that the powder will "clog the pores"; they pour out oil far too actively to be incommoded by a little powder.

Diseases.—If the face is exceptionally greasy and pimples, spots, and blackheads are present, the condition is definitely abnormal. It is due to a disease known as *Acne vulgaris*, and is very frequently associated with oiliness of the scalp, or *Seborrhœa*, which need special treatments. It may be said here that by far the best plan to save time, trouble and money is to seek medical advice *early* in cases of skin trouble, however slight. If taken in hand at the beginning most skin diseases are readily cured, but tend to become very chronic and most difficult to treat if neglected.

Cosmetics.—It may perhaps seem surprising that so few cosmetic preparations have been mentioned in the care of the complexion, as they are so commonly, almost universally, used at the present time. It has been found, however, more convenient to discuss them fully and as a whole in a separate article, than to overburden each section of "Beauty Culture" with scattered references. Another reason for omitting mention of all but a few cosmetics here is that their *indiscriminate* use, without consideration of their ingredients and the type of skin for which they are adapted, may spoil the complexion. The simple preparations already mentioned are harmless, and will add to the beauty of the complexion if used intelligently.

MAKE-UP.—It would be impossible to leave the subject of the care of the complexion without some reference to the use of coloured cosmetics. The practice is familiarly known as "make-up," and (doubtless under other names) goes back to the dawn of history. The skin-specialist may condemn make-up, but since it is so popular, a few comments on the best way to employ it may be useful.

Essentials.—Carefully chosen and applied make-up, it cannot be denied, is very becoming, and undoubtedly adds to the appearance of most people. All coloured cosmetics, however, except on the stage, should be applied sparingly as well as carefully.

Face-Powder.—Face-powder is made in many different shades, and care should be taken to choose one which is suitable for the natural colouring. A "warm" tint such as peach is more becoming to most people than a "cold" shade such as rachel. If preferred, one can have the powder specially blended, or can buy one or two shades and try a few experiments in colour-blending at home. For day use, a powder a little darker than the skin, and for evening a powder a little lighter, is becoming. Powder should be applied evenly all over the face up to the hair, except just round the eyes. The neck should not be forgotten. A light gentle "dust-over" is all that is required, as one is not trying to hide the skin but to add to its beauty.

Blue powder is sometimes used for shading the eye-lids, but it produces an effect only suited to the stage. Green and mauve powders, on the other hand, if quite pale in colour, are distinctly useful in toning down a florid complexion, including a red nose.

Rouge.—Rouge should be chosen from among the salmon-pink rather than the bright pink shades, which are only suitable for the very young (who should not need any). There are several varieties—cream, liquid, or powder, the first two of which are applied before powdering, and the last after. Two shades should be chosen, as in the case of powder, for day and evening use. A good plan is to test both by sunlight and artificial light respectively, and choose accordingly. To obtain a good effect, rouge should be applied over the natural flush, but as a general rule should be kept high on the face, and not too near the nose. Applied high up on the cheek-bones, rouge tends to make a round face appear longer; to shorten and broaden a long thin face, rouge should be applied lower down and over a larger area of the cheeks.



Face massage is a refreshing and beneficial treatment when properly carried out, and it will help to prevent the premature appearance of wrinkles or a double chin.

Lipstick.—Lipstick must in the same way blend with the natural colouring and the rouge. It may be indelible or emollient, the latter being better for the skin. To apply, one should moisten the lips, press them together lightly, and broaden the mouth, as if slightly smiling. The lips should never be puckered during the application, or the colour will be streaky. Generally speaking, lipstick should be applied rather more

heavily in the centre of the mouth, and should gradually shade off, stopping short of the corners. This makes the mouth appear smaller. Any attempt at making a rose-bud from a large mouth by limiting the area of application is only effective on the stage.

FACE-MASSAGE.—Massage is undoubtedly beneficial in some abnormal cases, but is not so universally beneficial as is generally thought. It is, however, a refreshing and pleasant treatment when properly carried out. It will *not* remove wrinkles or a double chin, but may help to prevent their premature occurrence.

The art of massage requires a most careful training, that of face-massage in particular, and no one but a skilled masseuse should attempt to perform it. The delicate yet firm touch necessary for this branch of massage takes *years* to acquire.

A good deal of harm, on the other hand, may result from the vigorous rubbing in of a stiff cream in the wrong direction. With regard to the use of any cosmetic preparations on the face and neck, one should always be most careful not to rub them in *roughly*, dragging and stretching of the skin being the result of this treatment. Any preparation used should be fluid enough to be smoothed on, even if it is necessary to warm it.

Massage of the other parts of the body, such as the arms, feet, and legs, may be practised at home, these not requiring nearly such a perfect technique. A trained masseuse, naturally, will perform the treatment far more satisfactorily. Rubber rollers are also useful in careful hands.

It is only fair to add the warning that massage regularly employed develops the shoulders and arms just as any other exercise, and tends to make the hands broad and coarse in appearance.

FACE-PACKS. Mud-pack.—The basis of the mud-pack is fuller's earth, a soft, rather greasy-feeling clay which is dirty brownish in colour. (Kaolin and talc, both used in the preparation of powders, are nearly related substances.) To prepare the pack, fuller's earth is mixed with glycerine and tincture of benzoin, and perfumed, and then made into "mud" by the addition of starch paste made with warm water, or water alone. It is naturally a rather difficult process to treat oneself, though many women do manage to do so, but it is more satisfactory to have the treatment carried out by an expert, or at least to have an assistant. The face should be thoroughly washed before the application of the pack, and steamed over hot water for a few minutes, in order to relax the skin and open the pores. The mud is then spread thickly over the whole face, including the eyelids, up to the hair-line, and down the neck, leaving only two airholes for breathing. During the process the face must be kept quite motionless, or the drying mud will crack, and the whole treatment be ruined. The pack is left on for about 15 minutes to dry and become hard; if an assistant will "flap" it with a towel—or fan it—the drying will be hastened.

The dry mud is removed by means of a cloth wrung out of warm water. The face is thoroughly rinsed in warm water and then in cold. The treatment should be given once or twice a week, and will be found very refreshing. It acts as a *tergent* cleanser and tightens up the skin owing to the tincture of benzoin contained. It is especially useful for the greasy type of skin, removing much of the superfluous grease, as well as the dust and dirt which collects even on the cleanest skin. In this type of skin, after the treatment, a simple astringent lotion may be used, such as eau-de-Cologne: one teaspoonful to the pint of cold water; or the cleansing lotion mentioned under CARE OF THE COMPLEXION (p. 776, top of second column) will be useful. For the dry type of skin a pad of cotton-wool dipped in cream or lanoline should be gently wiped over the face afterwards.

Oatmeal and Almond Pack.—Oatmeal and almond meal, in equal parts, constitute a very simple pack which can readily be prepared at home and used without assistance. It is especially useful for a dry skin, or for any skin which has been exposed to the weather. It should be used once or twice a week. The meal is mixed with cold water and spread on the face and neck. A rather more convenient method is to use almond oil and oatmeal, mixed as before to a smooth rather thick paste, and applied in the usual way. It should be left on for five minutes, wiped off with a clean damp cloth, and a second coat applied. After treatment, the face should be rinsed in warm water, and in the case of a dry skin, a little cream applied.

Honey Pack.—A honey pack is also a perfectly easy method to use at home. It is

recommended for use in the case of people whose skin is "middle-aged," i.e. rather rough, flabby, or drawn. It certainly renders the skin temporarily soft and smooth, and is very refreshing. It may be used once or twice weekly.

The face should be well washed and steamed, and wiped over with cotton-wool dipped in cream or a little lanoline. The honey, which must be of good quality, and must show no sign of "turning," should be lightly spread on the face in the usual manner, and gently patted (not rubbed) in for ten or fifteen minutes, then removed, and the face cleansed as has been described.

FACE-LIFTING.—Wrinkles once formed can never be eradicated by conservative methods. The only means of contracting a skin which has become too large is to remove parts of it by surgical operation, in which the procedure, to explain simply, is very like that of a dressmaker who "takes in" a dress that is too large for a customer.

There are two methods of operation, the direct and the indirect. In the direct method parts of the wrinkled skin itself are removed; when the wound heals the skin is stretched and the folds smoothed out. The wrinkles most frequently removed by this method are those round the eyes, and the "double chin." In the indirect method the same result is obtained, i.e. an equal stretch of the skin, by making the cut, not at the site of the wrinkle, but at a convenient distance, where the resulting scar will be either invisible or inconspicuous. For instance, to remove wrinkles that stretch across the forehead in parallel lines, a strip of skin parallel with the edge of the hair is taken from the hairy scalp, and the wound closed by stitches. The resulting scar is naturally covered by hair and is invisible.

For wrinkles round the mouth and nose, the incision is made in the region of the temple beneath the hair and in front of the ear, and the required amount of skin removed. To remove vertical wrinkles of the neck, i.e. those which extend from beneath the lower jaw down towards the chest, a somewhat more complicated operation is performed, in which a triangular piece of skin is removed in the neighbourhood of the ear, the skin of the neck pulled upwards, and the wrinkles smoothed out. These last three operations, naturally, must always be performed on both sides, to avoid the grotesque effect of one side young, and the other old.

These are the true "face-lifting" operations, but it may not be out of place at this point to mention other operations of cosmetic nature, and discuss them as a whole. Another popular procedure is to have fat removed from the abdominal wall or "stomach," and sometimes from the chest, to reduce the waist and bust measurements respectively. In these cases fat is removed from beneath the skin, which then has a tuck taken in it, is sewn up and left to heal. In contrast to this, unsightly hollows, such as those which may occur beside the collar-bones, may be filled up by a substance resembling natural fat. Ears may be "re-set" if too prominent, or the little toes removed if the feet are thought too broad. There are various other "cosmetic" operations, more remarkable for ingenuity than common sense, but the above are the most usual.

In the first place, anyone intending to have such an operation performed should make careful enquiries as to the qualifications of the operator. As the law stands now (in England), anyone—without any surgical training whatever—can set up as a "Beauty Specialist," and perform such operations under local anæsthesia. It is, therefore, far better to go to a surgeon who has had special training in plastic (or cosmetic) surgery. Then the patient will have what is admittedly a very delicate operation, requiring not only surgical skill but the artistic eye, performed under the best conditions.

In skilled hands the resulting scar should be practically invisible. The operations for the removal of fat, too, are on the whole quite satisfactory. There are, however, two grave objections to the process of "face-lifting." One is, that the natural expression is removed along with the superfluous skin, and the patient's face becomes mask-like. A second and perhaps more serious objection is that these operations are not permanent in their effects. The younger the patient the more lasting is the result; but inevitably the time comes when the over-stretched skin takes its revenge, and the last state of the patient is worse than the first.

Naturally, it is a very different matter when, for instance, the face is disfigured in some way, as by burns, and a cosmetic operation will make all the difference between de-

formity and a natural appearance; between leading a normal life and one of "unhappy shrinking from the light." In these cases, if conditions are favourable, a cosmetic operation is always to be recommended.

To sum up, "face-lifting" and other such operations are perfectly safe, and temporarily satisfactory, when performed by skilled operators. It remains for the individual to choose between the necessity of "growing old gracefully," or growing old, as Mr. E. F. Benson puts it, in the guise of a "grisly kitten."

SKIN BLEMISHES.—Some people are afflicted with various conditions of the skin which, though hardly coming under the heading of skin diseases (as they cause no difference to the health), are yet very trying from the beauty point of view. These are more fully discussed under their own headings, but it may be helpful briefly to go over the more usual ones here.

The colour blemishes, as they may be called, are freckles (ephelides and lentigines), moles, birthmarks (nævi), "liver spots," white spots (vitiligo), and yellow spots on the eyelids (xanthelasma palpebrarum). Rarer conditions, which may cause unusual colour, are *albinism* and *chloasma*.

Next come small tumour blemishes: warts of all varieties, milia (small white lumps, generally occurring on the face), sebaceous cysts, which may be of any size, and the larger birthmarks, forming definite tumours. "Goose-flesh" (lichen pilaris), and enlarged pores (megaloporia), though not true tumours, might be included under this heading.

Enlarged veins, or telangiectases, occur from much exposure to weather (this is rarely found among women); in several skin diseases, such as acne rosacea; and sometimes in connection with birthmarks. Their treatment is discussed along with these diseases.

"Red nose" is a troublesome affliction, and the causes of it are legion. With some people it appears to be constitutional; it is probably associated with a poor circulation, and often with chilblains, and is particularly noticeable in changes of temperature. In this case warm clothing, and the use of a greenish face-powder, are practically all that can be suggested in the way of treatment. It has been said that benzine compresses should be used. The patient is advised to place rags soaked in benzine upon the nose whenever he enters or leaves a room. This may be successful, but is rather a conspicuous treatment, and apt to excite comment!

Scars, from burning or other injury, and pock-marks sometimes need to be treated; as do tattoo-marks, whether produced in the usual way, or accidentally, by a coal or gun explosion, whereby small black particles are driven into the skin of the face—luckily a very rare accident among women.

One thing only remains to be said with regard to skin blemishes: as with skin diseases, it is unwise to attempt home treatment for moles, warts, or birthmarks, as interference may do much harm, and cause a very serious condition of health. A skin specialist should be consulted if any improvement is desired.

WRINKLES.—The under layer of the skin (the vera cutis or true skin) is elastic, and in health adapts itself to the movements of the body. Its elasticity always becomes diminished by age, and may be diminished earlier by various factors, which will be discussed in detail. The skin then is slightly too large for the body, and wrinkles result.

Their occurrence may be retarded, until age comes on, first and foremost by a healthy life and contented outlook: worry and bad temper are fatal. It is noteworthy that it is not real troubles, but petty worries and all the nagging trifles of every day, that are responsible for premature wrinkling!

People who possess a very *fine-textured skin* tend to wrinkle early. In these cases the skin is deficient in oil, and therefore undernourished, with the result that soon after thirty a multitude of tiny lines, which naturally become more pronounced in course of time, make their appearance. The possessor of a greasy skin, though never having so fine a complexion in youth as her thinner-skinned sister, is lucky in that her skin (with reasonable care) remains practically unaltered until she acquires the wrinkles of middle age.

In some cases of premature wrinkling the *eyes* are at fault; either glasses are needed, or those worn are unsatisfactory. If the eyes are known to be weak, they should be reexamined periodically, as the oculist will direct; and if a tendency to frown is noticed when the eyes are used, there is probably something needing correction. To wear glasses does not give nearly such an old look to the face as do the wrinkles caused by constant frowning or screwing up the eyes.

Uncomfortable clothes are a cause of lines on the face, especially uncomfortable shoes. Women have wisely discarded two instruments of torture, the strangling collar and the squeezing corset, but they seem more reluctant about shoes. The discomfort of too narrow soles and too high heels still produces the frown of pain.

Poor general condition, over-work, late hours and curtailed sleep, and the feeling of being "below par," are very ageing. It is well known that certain diseases produce their own definite lines on the face—these are to some extent unavoidable—but one can avoid, for instance, the unhappy peevish frown that results from chronic constipation.

Too rapid "*slimming,*" or slimming after the skin has become thoroughly overstretched by the underlying layers of fat, sometimes produces a remarkable condition of wrinkling. The skin, being so much too large for the body, hangs in folds and creases. The result is far more ageing than the former condition of obesity.

It is obvious that when the skin has become stretched, and wrinkles *have formed,* the only method of removal is by operation. (*See* FACE-LIFTING.) Much may be done, however, to retard the formation of wrinkles. In the first place, one should avoid the causes which have been discussed above, as far as is possible. Absolute necessities for a "young" skin are plenty of sleep, exercise in the open, a wholesome diet with no "fads," and a good temper. Secondly, the "type" of skin should be carefully considered, and cared for as has been described in a previous article. (*See* CARE OF THE SKIN.) With reasonable attention of this sort, wrinkles should be kept at bay for many years.

CARE OF THE EYES, EYEBROWS, AND EYELASHES.—The care of the eyes is most important, for the preservation of both health and beauty. If they are healthy it is, however, quite unnecessary to bathe them daily, as is frequently suggested. They are kept bathed by the natural secretion (tears) in a far better way than by any manufactured lotions; and if they habitually feel dry or sore, a doctor should be consulted. A refreshing lotion may sometimes be needed if the eyes have been subjected to strain and are tired; normal saline (1 teaspoonful of salt to 1 pint of boiled water), which is of practically the same composition as the natural secretion, will do no harm, and relieve the hot dry feeling. Sodium bicarbonate in the same strength is also good. Other lotions should be left to the doctor to prescribe.

"Eye exercises" are also suggested by some beauty specialists. These are not really necessary as the eyes are in almost constant movement all day long. Moreover, it is quite likely that exercises may be performed too vigorously, and the muscles holding the eye in place be strained thereby.

Great care should be taken not to strain the eyes by working in a poor light or a bad position—never, for instance, read when lying on the back. Eyestrain causes wrinkles and frown-lines as well as injury to the eyes themselves. The book or work should be at about twelve inches from the eyes, and slightly below their level.

If the eyes are "uncomfortable" when reading or other close work is done, or, alternatively, when distant objects are looked at, an oculist should be consulted. Some people, especially women, object to wearing glasses, as being disfiguring. Some are; but quite unobtrusive patterns may be chosen, and glasses are far less unattractive than the wrinkles and ageing headaches caused by strained eyes. If the hair is dressed suitably, and becoming types of hats are worn, glasses should not appear unbecoming.

Crowsfeet and wrinkled eyelids come with age, do what one may. To avoid a too premature occurrence, one should avoid the habit, which many people possess, of unnecessarily "crinkling up" the eyes when working. Massage by a trained masseuse may help; and the use of natural cream or almond oil at night helps to nourish the skin. If one can spare the time for half an hour's rest in a darkened room during the day, the eyes and eyelids are greatly benefited. Pads of cotton-wool soaked in milk, cream, or almond oil may be placed over the eyelids, and are very soothing.

In health, the eyebrows and eyelashes are always slightly lighter than the hair. If it is desired to darken them, warm olive oil should be applied every night with a small brush. Dyeing is inadvisable, owing to possible ill effects on the eyes; but if it is resorted to, *must* be done by a reliable and experienced person. The process needs to be repeated every two or three months. Mascara is commonly used, but that is a matter of taste.

"Plucking" the eyebrows seems to be losing its popularity. Straggly hairs that spoil the line of the brows may certainly be plucked, but brows that are no more than dark lines on the forehead seem to take away all "character" from the face. If the stragglers are removed, a pair of forceps is used, and the hairs separately pulled out sharply in the direction in which they grow.

CARE OF THE FEET AND ANKLES.—Although the feet are kept covered, it would be quite contrary to the ideal of beauty to dismiss them as being "out of sight, out of mind." Neglect not only causes troubles such as corns, bunions, and so on, but aching and weariness.

Washing and Massage.—The feet should be bathed, and the stockings changed, daily and, in addition, after strenuous exercise. Shoes should not be worn too long at a time; even if well-fitting, to wear the same pair for a whole day is very fatiguing. After the bath, the feet should be massaged with pure oil of sweet almonds or olive oil; or this can be done quite well in the bath with soap. The foot should be firmly grasped by the two hands, and pressed and kneaded all over. Each toe should be treated separately. Finally, the foot and ankle should be firmly stroked, both back and front, towards the knee. This procedure takes only a very few minutes, and the immediate relief from a "tired ache" must be felt to be believed.

Exercises.—Foot exercises are also very beneficial to both feet and ankles. They can be performed practically all day long. When walking, the feet should be put straight forward, not turned out. When sitting, similar ugly positions should be avoided, and the toes pointed downwards. If one has to stand for long periods, flat-foot may be prevented by standing on the outsides of the feet for a few minutes at a time; this is a well-known "tip" among nurses. As regards definite exercises, the arch of the foot may be preserved and the ankles kept shapely by the following, which should be performed twenty times each, night and morning: (1) In the upright position, with the feet pointing straight ahead, and the hands on the hips, rise on the toes, and go down slowly. (2) Sitting, bend the feet upwards and downwards, and then turn the ankles round and round, first outwards, then inwards.

Dancing is also an excellent exercise.

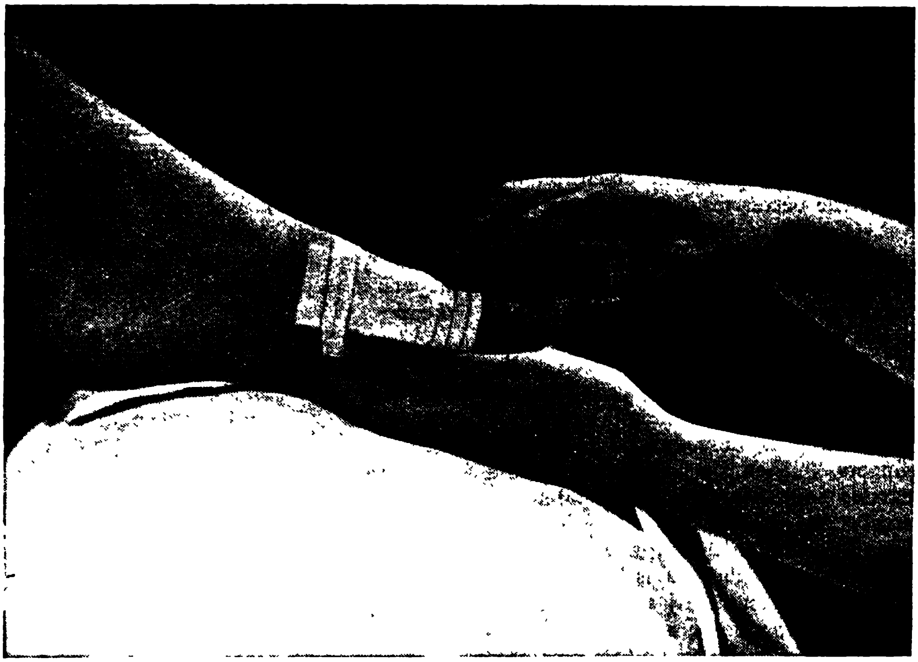
Toe-Nails and Skin.—The toe-nails should be cut straight across, to avoid in-growing toe-nails; the cuticle pushed back with an orange-stick after bathing, and any hard skin rubbed off with a rough towel or pumice-stone. It is a good habit to powder the feet, especially between the toes. A good talc powder should be used; not starch, as it tends to cause irritation when in contact with the perspiration. The feet may be "hardened" before walking by painting them with eau-de-Cologne or a similar alcoholic preparation before powdering them.

Shoes, etc.—The feet should be kept warm, as cold feet not only lower one's resistance to colds and other ailments, but show their resentment by reddening the nose! The fashion for wearing woollen ankle-socks in cold weather is, therefore, to be commended. The very important subject of shoes and stockings is fully discussed in a separate article, which should be read in conjunction with this. (*See* BOOTS AND SHOES.) No reference is made here to foot-troubles such as excessive perspiration, corns and so on, as they, too, are discussed under separate headings. (*See* BUNION; BURSITIS; CORN.)

CARE OF THE HAIR.—*See* article on HAIR, STRUCTURE OF.

Type.—The beauty of the hair is largely dependent on health. A clean scalp and a good circulation are essential factors, and anything which lowers one's standard of perfect health shows itself in lessened beauty of the hair. Hair varies very much in nature, from the coarse wiry type, rather like horse-hair, which is easy to arrange and always looks plentiful, to the fine soft "baby" variety, which shows every variation of health, and is of all types the most difficult to "manage." These factors cannot be altered, but everyone can have a well-groomed head by carrying out a few simple rules.

Cleanliness.—In the first place, everything used for the hair should be spotlessly clean. Brushes should be of good quality; the whalebone-bristle variety is perhaps the best, as it is not so stiff as to damage the hair, but the bristles are long and stiff enough to brush the *scalp*, not only the *hair*. Combs should always be blunt-toothed. Both combs and brushes should be washed twice a week, and kept in a bag, which should be washed as frequently. If the brushes are rinsed finally in cold water the



A pad protecting a bunion, held in place with adhesive strapping.



Removal of horny part of corn, after softening.

bristles will remain stiff. It will readily be understood that brushes and combs easily become dirty, dusty, and scurfy, and if they are used in this condition, the health of the hair suffers, and the hair will become poor and tend to fall out.

Massage.—Secondly, there must be *daily* care of the hair. Spasmodic attention will produce little better results than consistent neglect. Massage of the scalp is perhaps the best method for promoting hair health, and guarding against loss. A good surface massage can be given by means of a blunt-toothed comb, but the most thorough way is with the hands. The thumbs should be placed at the back of the ears, and the scalp rotated under the finger-tips; one should make sure that the scalp is moved, and not only the fingers. Then deep pressure should be carried out; in this the palms of the hands are pressed firmly against the scalp, and the fingers attempt to pull down the scalp towards the palms. The whole scalp should be treated by both these processes, to render it loose and elastic. This ensures a good circulation and an increased blood-supply to the hair-roots. A tight scalp will, unless treated, sooner or later produce thin poor hair. If the scalp seems unduly tight it should, in addition to the other forms of massage, be well pinched all over, and the hair gently pulled by steady lifting; it should not be jerked.

Lotions.—Massage may be combined with the use of a lotion. Any lotion, moreover, that contains alcohol or essential oils is useful in one way: that of acting as an antiseptic. A good bay rum, which consists of bay oil dissolved in alcohol and perfumed, is an excellent lotion of this type. A rather more powerful hair tonic consists of capsicum (red pepper) in alcohol and water. Quinine lotions, which are popular at present, are useful because of the alcohol they contain.

Brushing.—The hair should be well brushed for five minutes night and morning, preferably in front of an open window, as air is necessary for hair health. Brushing should not be so vigorous as to stretch the hair or it will be weakened. It is an excellent thing to brush the hair from back to front; by this method dust and scurf can readily be removed, the hair is well ventilated, and the scalp exercised. The full length of the hair should be brushed, both to clean it and to distribute the natural oil. The brush should be wiped on a clean towel several times during brushing to remove dust and scurf.

Waving.—Opinions are divided as to whether waving harms the hair. Probably the unhygienic methods adopted to "keep in the wave" are more harmful than the actual process of waving. These consist, in many cases, of giving the hair no attention between one "setting" and the next beyond a very light combing, and sleeping in a cap.

As regards hats, the best kind for the hair would be none at all except in very brilliant sunshine: but, since one must be worn, it should be light and well ventilated. The lining should be washed once a week.

Shampoo.—No hard and fast rule can be laid down about the frequency of washing the hair. Roughly, once a week in the town and once a fortnight in the country should be enough. One should, however, take into consideration whether the hair is naturally dry or greasy, the latter requiring more frequent washing. A good shampoo consists of a tablespoonful of shredded soap (any good toilet soap will do), melted in half-a-pint of hot water. One teaspoonful of glycerine and two of eau-de-Cologne are then added. A milder shampoo, suitable for dry hair, is a tablespoonful of pure olive oil well mixed with the yolk of an egg and the juice of half a lemon. A perfumed shampoo is desirable, as not only does it produce a pleasant cosmetic effect, but as nearly all perfumes act as antiseptics, it helps to keep the hair healthy. Wet the hair well before the shampoo is applied; this helps to prevent the formation of scurf. Soft water or rain water should be used when possible. The head should be well lathered twice, and rinsed several times in warm (not hot) water. Running water is best, as this will remove all traces of soap. "Sticky" hair not only looks ill-groomed, but very easily picks up dust. Many people guard against this by using the juice of half a lemon in the final rinse.

Drying.—The hair should not be dried in front of the fire, but rubbed as dry as possible with clean warm towels, and then allowed to dry in a warm room or out of doors. It should not be brushed or roughly combed until it is dry, as wet



A well-kept head of hair dressed to suit the wearer's appearance rather than in accordance with current fashions is one of the most important aids to beauty.

hair is easily stretched and weakened. Gentle combing is permissible, and will hasten the drying process. If the hair is naturally or "permanently" waved, it may be "set" when half dry, and allowed to dry under a net. Combs may be used. If the hair is inclined to be dry, a little brilliantine or hair-oil should be applied after drying. Setting lotions are usually made by dissolving borax or a gum or resin in alcohol, suitably perfumed, and diluted with water.

Fair Hair.—Fair hair is liable to darken or become faded at a comparatively early age and must be looked after with special care. A camomile rinse after the shampoo is very useful in preserving the colour. A tablespoonful of powdered camomile should be "mashed" in the same way as tea, in half a pint of boiling water. After drawing for three minutes, half a pint of cold water should be added to bring the mixture to the proper temperature. The hair should be well rinsed in this, and then given a final rinsing with clear water. Another method of preventing darkening is by adding a very little hydrogen peroxide to the final rinsing water when shampooing. This produces just the slight bleaching that is required; too much gives the "peroxide blonde" effect. Fair-haired and white-haired people should be especially careful when buying applications for the hair, as many of these, quite good in their way, contain substances which tend to darken the hair. A reliable chemist will be able to give information on this point.

White Hair.—White hair needs no other special care, except that its possessor should be careful to avoid heat to the hair in any form, as it will become yellowish in colour. Adding a little washing-blue to the final rinse when shampooing helps to keep its snow-white colour.

Dark Hair.—Dark hair may be improved in colour by the addition of a little henna to the shampoo. This is most conveniently done by using a ready-prepared henna shampoo powder of good quality; or by making an infusion of henna leaves in the same way as the camomile infusion described above.

An oil shampoo is an excellent treatment, especially for hair that tends to be dry and poor, rendering it silky and glossy. A sufficient quantity of pure olive oil should be warmed, and applied as a lotion, massaging it in well all over the scalp, and using enough to make all the hair thoroughly oily. The head should be wrapped up in a towel for an hour at least, and then shampooed in the usual way. Unfortunately, this treatment cannot be used by fair-haired people, as the hair will thereby be darkened.

Dry Shampoo.—A dry shampoo may be given in two ways, either by a powder, or by soap dissolved in spirit; it is very convenient when a wet shampoo cannot be given. The best powder to use is very fine rice flour, or one of the good quality powders on the market.

The dry shampoo, if used, should be given once a week. The hair should be parted, and the powder well dusted in with cotton-wool. Numerous partings should be made until the scalp has been thoroughly covered with the powder. It should be left on for at least an hour, preferably all night, so that all the grease will be absorbed, then removed as far as possible with a clean brush and comb. The scalp should then be cleaned by means of cotton-wool dipped in a mixture of equal parts of eau-de-Cologne and water. The liquid dry shampoos are simply given by treating the whole scalp with the shampoo on cotton-wool pads, and allowing it to dry. These shampoos should be made up with pure dilute alcohol; impure alcohol, benzine, petrol, and other similar solvents, which are widely used, certainly clean the hair, but tend to irritate the scalp. Of course, the danger of fire must be remembered.

Hair Ailments.—Hair ailments, such as dandruff and scurf, brittle and falling hair, grease or dryness, should never be neglected, even if only a slight departure from the normal is noticed. Briefly, it may be said here that many mild cases are caused by simple neglect of brushing and washing the hair, and are cured when the hair is properly attended to. Cases which do not yield to simple treatment always indicate an unhealthy condition of some kind, and should be treated by a hair-specialist (not only a hair-dresser). (*See* under separate headings.)

GREY HAIR (Canities).—As middle age comes on, the natural pigment of the hair tends to disappear, and the hair becomes grey, and finally completely white. Sometimes the hair begins to turn grey at an early age, through heredity, nervous shock, or disease. When premature greying occurs, it is always advisable to be thoroughly

examined by a competent medical man. In cases of falling hair, too, this advice holds good. (*See also* FALLING AND BRITTLE HAIR.)

Dyeing.—Dyeing grey or any other coloured hair is naturally a matter of choice. The normal care of grey hair has already been given. If it is decided to dye the hair, it must be emphasized that this is only satisfactory, and may not be then, if done by a thoroughly experienced hair-dresser.

Bleaching.—Bleaching, too, should always be performed by a skilled hair-dresser. It is a delicate operation and, if well done, quite harmless; but in unskilled hands may damage the hair seriously, as well as produce extraordinary effects.

Camomile and Henna.—The camomile and henna treatments, described in CARE OF THE HAIR, hardly come under the heading of dyes, their effect being to emphasize the existing colour of the hair. They have been aptly described as "colour tonics." They may, however, be used as dyes.

SUPERFLUOUS HAIR (Hypertrichosis).—By this term is meant hair in the wrong place, considered cosmetically; that is, under the arms, on the legs and forearms, and especially on the face, in women. The scientific explanation is that the whole body, except the palms and the soles, is covered with a fine growth called lanugo hair. Superfluous hair results from the development of the lanugo hairs into hairs of ordinary size.

Hydrogen Peroxide.—Where the growth is soft and downy, it may be made less conspicuous by the use, every other day, of a bleaching solution consisting of hydrogen peroxide in 20 volume strength. As far as possible, the peroxide should be prevented from coming into contact with the skin by raising the hairs by means of a sheet of stiff paper; it tends to bleach and dry the skin, and may in time cause dermatitis. This preparation not only bleaches, but will in time weaken the growth of hair, but it must be persevered with for some weeks before this effect is seen. A paste of hydrogen peroxide with kaolin and a little ammonia is sometimes employed with success. With regard to advertised depilatories many of them are composed of barium sulphide, but sulphides of calcium, sodium, strontium or magnesium are also used. As a general rule they serve their purpose and are harmless to the skin, but it must always be remembered that there are many sensitive skins which will not stand the application of any strong chemical substances. Possessors of delicate skins must test any new cosmetic carefully on a small concealed area of the skin before risking its use on the face or scalp.

Mechanical Methods.—The hair may be removed by various mechanical means. *Cutting* is quite harmless, but almost impossible to perform satisfactorily. *Shaving* is temporarily efficacious, but is commonly believed to coarsen the hair and, in brunettes at least, tends to darken or discolour the skin. *Plucking* the hair may be done with cilia forceps, by a resin pencil—both of which remove a single hair at a time—or by a specially prepared wax, which is spread on the skin and, by forcible removal, brings away the hair with it. These methods are slightly painful, and may irritate the skin. The wax treatment is suitable for a fine growth. *Rubbing* the skin with pumice-stone, or with a preparation resembling this, is sometimes practised for the removal of hair on the forearms and legs. The above-mentioned methods are only temporary in their effects.

X-rays.—No satisfactory method by this means has been devised. It is, of course, quite possible to remove hair *temporarily* by a dose of X-rays, but in that case the method is no better, and far more expensive, than others. It is also possible to make sure of *permanent* depilation, but the question remains whether the large dose of X-rays necessary in this case will not cause damage to and changes in the skin. With further research, however, doctors may hit the happy mean, and then this method of depilation will be by far the most satisfactory of the local treatments.

Punching.—Punching, or removal of the hair by a very fine cylindrical knife, is of service in the hands of a skilled operator, but is only suitable for the removal of large isolated hairs, and needs a vast amount of patience on the part of both patient and physician. The hair root is permanently destroyed by this process.

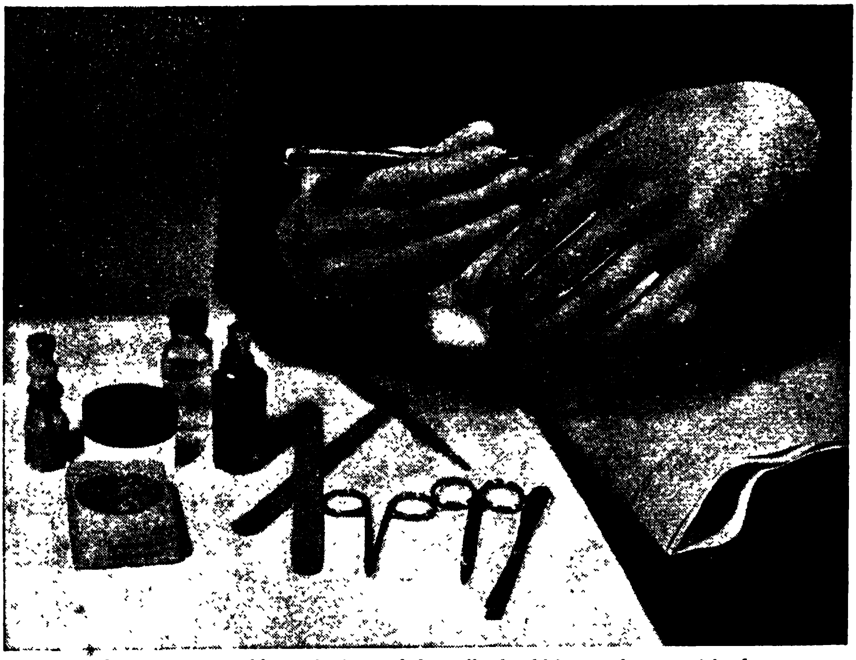
Electrolysis.—Electrolysis is also a permanent method of removing unwanted hair. Briefly, the root of the hair is destroyed by piercing it with a fine needle, and passing an electric current through it. Each hair must be treated separately. This technique demands a highly skilled operator, who pos-

sesses a steady hand and a very delicate touch; if electrolysis is improperly carried out, the hair root may be missed, and the skin may be marked in a most unsightly fashion. It has sometimes been necessary to remove the disfigured skin and replace by a skin-graft. It is, as may readily be seen, unsuitable for fine, downy growths.

Diathermy.—Diathermy is a comparatively new method. Its practical technique is like that of electrolysis, but the root of the hair is killed, not by an electric current, but by electrically-produced heat in the needle. It is claimed to give more satisfactory results than electrolysis.

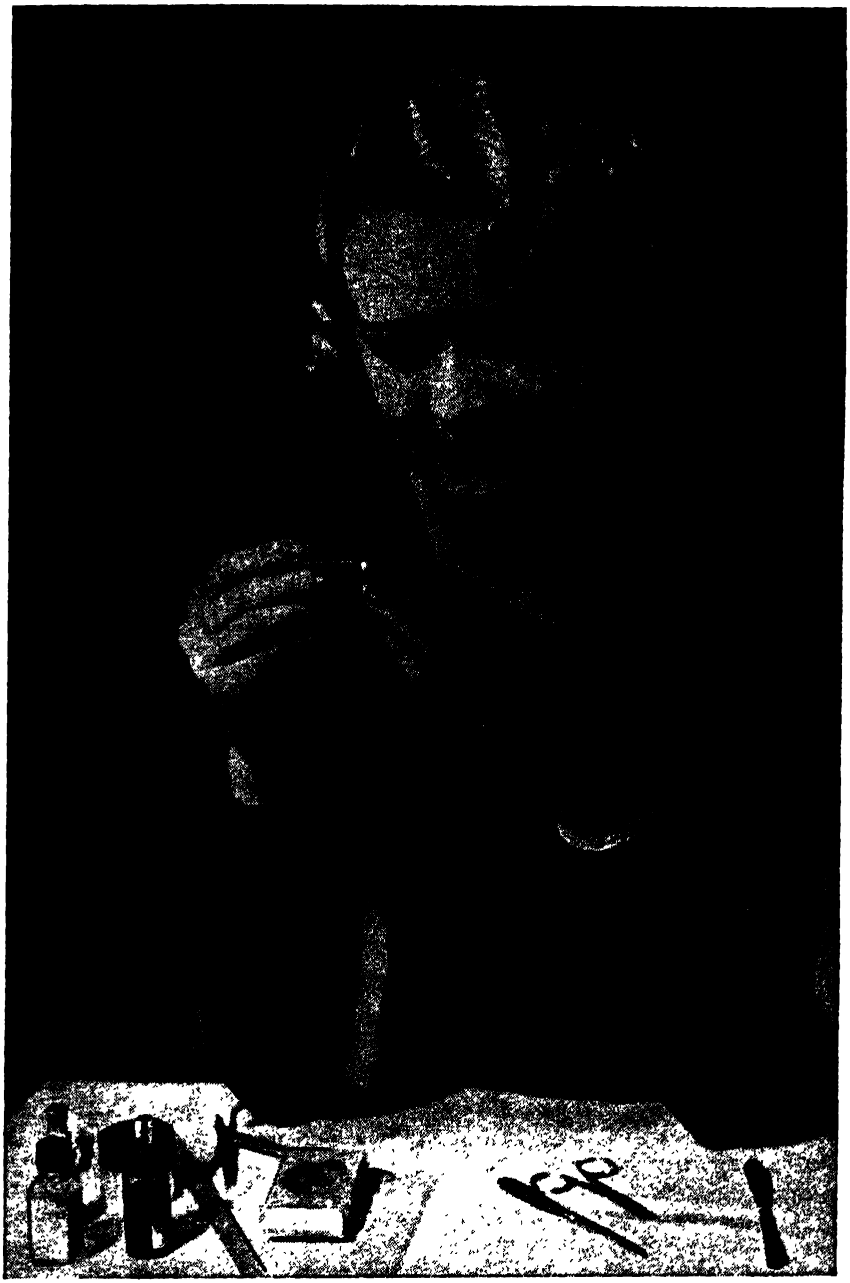
Thyroid.—All these methods of depilation, however, are merely palliative in that they merely treat the local growths of hair, and do not aim at the *cause* of the growth. Some doctors very reasonably suggest that both superfluous and poor thin hair are due to defective functioning of certain of the internal glands of the body, notably the thyroid and the ovarian glands. In some cases, where the hair growth is plentiful and coarse, excellent results have been obtained by the use of thyroid extract. (Thyroid preparations must never be taken except under medical supervision.) In other cases, it appears to be a failure. But the whole subject of glandular treatment is still in its infancy, and it is impossible to make hard and fast statements about it.

CARE OF THE HANDS.—The hands, like the neck, give tell-tale evidence as to age unless they are properly cared for, but no other part of the body so much repays care. It is quite easy to treat the hands at home and if this is done regularly, one can have comely-looking hands all one's life.



The cuticle, the skin at the base of the nail, should be gently pushed back.

Housework is one of the worst possible occupations as far as the hands are concerned, and in discussing the treatment of hands exposed to its vicissitudes we include lesser evils. Rubber gloves should be worn for washing-up, silver- or brass-cleaning, and similar things; and housemaid's gloves for general cleaning. If gardening is done, the hands should be rubbed with a lotion first, and the nails filled with soap before the gloves are put on. In this way the hands will not acquire the appearance of ingrained dirt, and the roughness and redness so characteristic, alas! of the "good housewife." When it is necessary for the hands to be in contact with hot water and



The nails should be thoroughly manicured at least once a week in order to enhance the beauty of the hands.

washing-soda, the ill-effects of this may be counteracted by washing them afterwards in water containing a tablespoonful of vinegar or lemon-juice.

A lotion should be used regularly after washing the hands. Rosewater and glycerine, or glycerine and cucumber, are both excellent and cheap. A glycerine cream, or honey and almond cream, are more suitable where the skin tends to be thin and dry. Lemon-juice is very useful for whitening the hands and removing stains from them. As the hands need frequent washing, they are often deprived of their natural grease and become rough and red; in these cases lanoline (which is the nearest substance to natural fat) should be well rubbed in at night, and a pair of loose gloves worn. Some people prefer a glycerine preparation. Cocoa butter is excellent, but in the natural state has a clinging and somewhat unpleasant odour; it may, however, be perfumed. In cases which do not respond to ordinary treatment it should certainly be tried. It generally requires warming before use. (*See also* Chapped Hands and Lips.)

If the fingers are blunt and square, they should be exercised several times daily. Each finger should be taken between the thumb and finger of the other hand and pressed downwards as if one were putting on new gloves. This improves their shape.

The nails should be thoroughly manicured once a week. The hands should first be washed and the nails cleaned, and then soaked for five minutes in hot soapy water, preferably softened with oatmeal or borax. Then, after drying the hands, the nails should be filed with a flexible steel file, working from the sides of the nails to the centre, and filing to the shape of the finger-tips. If the "half-moons" are prominent, a good effect is obtained by filing the nails to correspond with the shape of the half-moon. They should finally be smoothed with an emery board. (Scissors and cuticle-knife, by the way, should be barred. They are far too coarse for the dainty business of manicure.) Then the nails should once more be soaked, and the cuticle (the skin at the base of the nail) treated. A small piece of cotton-wool should be wrapped round an orange-stick and dipped in a cuticle-remover, and with this the cuticle should be gently pushed back and, if any is loose, removed with a dry clean orange-stick. Rough treatment defeats its own purpose by splitting the cuticle and causing hang-nails; and, in addition, scratches are made on the nail surface. The cuticle-remover should finally be rinsed from the hands: this should always be done, as these preparations are caustic. They are often combined with a nail-bleach.

Polishing the nails is carried out either by paste or powder and a nail buffer, or by means of enamel. Either is good, but the enamel does not cause, as the buffer may do, a rubbed appearance of the cuticle and a tendency to hang-nails. It is also far quicker to use, and is more lasting in its effects. The old coat should be removed by means of a polish remover before re-enamelling. Nail-white may be used under the nails if liked.

As regards daily care, filing should be done where necessary, and the cuticle pushed back with an orange-stick after washing. At night a little "cuticle-ointment" should be rubbed round the nails into the cuticle to keep it soft and flexible. Manicure, like make-up, should be perfectly done and entirely unobtrusive. Unless the hands are beautiful, ostentatious manicure will only too surely draw attention to any faults.

Nails which easily split, and which are marked by transverse ridges or white lines, show that the general health is not good, the nails of course sharing health or ill-health with the rest of the body. No local treatment will alter this appearance, and if the condition of the nails does not improve, a skin specialist should be consulted. (*See also* Nails, Diseases of.)

Chilblains are very disfiguring to the hands. They are fully discussed elsewhere. (*See* Chilblains.)

CARE OF THE NECK, SHOULDERS, AND ARMS. General Care.—The neck is perhaps the most tell-tale part of the body; unless properly cared for it soon shows signs of age. The skin should be treated much as that of the face, taking into consideration the type of skin. In addition, it should be washed and dried *carefully;* many people use an undue degree of roughness, which does much to pull and stretch the skin. In addition, it may be said that one should avoid friction from collars and furs, as these readily cause discoloration and roughness. Jewellery also (except platinum), will discolour some skins, and should be avoided in these cases. One

of the best ways of keeping a "young" neck is to hold the head up; a faulty position will assuredly cause a "dew-lap," if not a double chin, sooner or later.

Thin Necks.—Thin necks must be well-treated, or they will soon become scraggy. After washing, almond or olive oil should be applied by patting, not rubbing, in daily. Exercises should be performed daily to help to fill out hollows and to develop the neck.

Fat Necks.—If the neck is too fat, after washing it should be patted sharply all over with cotton-wool dipped in an astringent lotion; the cleansing lotion recommended for the skin may be used, with the addition of two tablespoonfuls of eau-de-Cologne. Exercises are also valuable in this connection, but home massage should not be tried (*see* FACE MASSAGE), or the condition will probably be rendered worse. Chin-straps do not produce any permanent benefit, and may make the muscles "lazy," so that the ultimate sagging may be greater than before.

Thin Shoulders.—Thin shoulders are benefited by a weekly massage with fat preparation—lanoline, almond or olive oil, or perfumed cocoa-butter all being excellent. The oil also softens and whitens the skin. This treatment should preferably be given at night, after a warm bath. The oil should be warmed, and gently rubbed into the skin with a round-and-round movement, until no more will be absorbed. A final brisk rub with a rough towel should be given.

Fat Shoulders.—Fat shoulders are difficult to improve. They may be whitened by the application of lemon-juice or a glycerine-and-cucumber preparation; but astringent lotions are of no use. It is not toning-up that is required, but removal of superfluous tissue. Massage by a really experienced person will probably effect some improvement; self-massage should not be given, since, to mention only one objection, the shoulders will be developed in the process. Daily exercises also help the condition to some extent.

Arms.—The arms should also receive their due amount of care, though naturally they do not suffer as do the hands from one's employment. One should, however, avoid the constant use of the elbows as means of support, otherwise redness and wrinkles are bound to occur. For a normal skin, the glycerine preparations mentioned for the hands are good, and lemon juice will whiten the skin, though it will not remove freckles, as is commonly stated.

Thin Arms.—If the arms are rough and red, thin, with wrinkled elbows, or show a tendency to "goose-flesh" (*see* LICHEN PILARIS), perfumed cocoa-butter is excellent, or one of the other fat preparations already mentioned. It should be applied as for thin shoulders, warming the oil, and working with a round-and-round movement up the arms.

Fat Arms.—If the arms are too fat they should be massaged from wrist to shoulder, always working upwards, and using rather firm pressure without in any way dragging the skin. This method also assists the circulation, and improves the appearance of hands and arms that tend to present a mottled purplish appearance in cold weather. Another method is to employ gentle friction with a well-soaped nail-brush; the rubber ones are especially good: always remembering to work upwards. Exercises and games both improve the shape of the arms, though with regard to the latter, if much indulged in, an unsymmetrical appearance may be produced by some varieties. Rowing (though it broadens the hands) exercises both arms equally; tennis, on the other hand, generally over-develops one arm considerably.

DIET AND "SLIMMING."—These subjects are rather more important from the point of view of health than from that of beauty. They are treated at length under OBESITY, and the SPECIAL SUPPLEMENT ON DIET.

EXERCISES. Head and Neck.—The following exercises are designed to give suppleness and beauty of form to thin necks. They should be persevered with until the desired development is achieved, and then discontinued.

Exercise No. 1.—Sit erect and bend the head forward and down. Clasp the hands behind the head and *slowly* raise it, resisting the movement by strong pressure from the interlaced hands. When the head is fully back, bend it forwards again, resisting this time by placing the palms under the chin and pushing upwards. Repeat the exercise ten to twenty times.

Exercise No. 2.—Lean the head well over to the right and place the left hand against the left temple. Bend the head over to the left, resisting with the left hand. When the

head has reached its limit, reverse the movement, resisting with the right hand and bending the head to the right. Repeat the exercise ten to twenty times.

Exercise No. 3.—Turn the head to the right as far as it will go. Turn it back to the left, resisting with the left hand against the chin. Reverse the movement by turning to the right and resisting with the right hand. Repeat the exercise ten to twenty times.

Slender Hips.—Excessive fat accumulates round the hips in two ways. It forms between and upon the muscle fibres, and as a superficial layer between the muscles and the skin.

There are various ways of getting rid of this superfluous fat, such as Turkish baths, fat-reducing medicines, and dieting, but the most natural and healthy is by exercising.

All forms of athletic sports and games tend to prevent the accumulation of fat and are therefore beneficial, but special exercises are also needed to reduce the often stubborn deposits of fat on the hips. These exercises act directly upon the hip muscles, loosening the fatty tissue in and upon the muscle fibres; but they also include various massage movements which act directly upon the superficial fat.

Exercise No. 1.—Stand with the heels together, toes pointing outwards, head erect, and hands placed upon the flanks *above* the hips with the fingers pointing down. Without moving the hands raise the legs alternately sideways as high as possible. Do not bend the knee, and straighten out the foot as the leg rises. Raise each leg ten times. At first inhale while raising and exhale while lowering each leg; later on it will be found possible to inhale during the raising and lowering of one leg and to exhale during the movement of the other.

When, after a few days' practice, proficiency is attained in this movement, the massage should be combined with the exercise. Each time a leg is raised the corresponding hand slides down over the hip and outside the thigh and knee. When the leg begins to descend, the hand passes to the inner side of the knee, and while the leg is dropping strokes the inner side of the thigh, passes up over the groin, and back to its place on the flank, fingers pointing down as before. Later on, when the exercise can be easily and correctly performed, try to press with the hands against the legs both when raising and when lowering them. In this way the exercise will develop perfectly shaped hips and impart grace and balance to the carriage.

Exercise No. 2.—Stand as in Exercise No. 1, but with the hands *on* the hips, fingers pointing down. Inhale and at the same time bend the body over to the right from the hips *as far as it will go*, sliding the right hand down the outer side of the right leg to arm's length, while the left arm slides up over the left hip and flank as high as it will go. Now, while exhaling, swing the body over to the left as far as it will go, sliding the left arm down the left flank, hip and thigh, and the right arm up the right side. Perform this exercise ten times to either side—twenty times in all.

When proficiency is attained, one complete cycle from right to left and back again may be performed for each inhalation and another cycle for each exhalation. The pressure of the hands on the body can also be increased.

In addition to giving the waist a classical line and reducing the hips, this exercise tones up the kidneys and liver.

Feet and Ankles.—These exercises are designed to improve the symmetry, and therefore the beauty, of the ankle and instep. They can be performed at any time when seated or lying in bed. They are also a sure method of quickly warming the feet.

Exercise No. 1.—This comprises four movements:

1. Bend the foot and toes upwards at the ankle as far as possible.
2. Hold the ankle motionless and bend down the toes as far as possible.
3. Keep the toes bent and straighten the ankle.
4. Hold the ankle motionless and bend up the toes again.

At first exercise one foot only; later, work both feet together. When quite proficient, blend the four movements together into one cycle and repeat several times.

Exercise No. 2.—Keeping the leg stationary, move the foot round from the ankle, the big toe describing the widest circles possible. When tired, exercise the other foot in the same way. Then exercise the first foot again, but this time rotate it in the opposite direction, following with the other foot in the same manner. When proficient, both feet should be exercised simultaneously.

DIET AND INVALID COOKERY

FEEDING is not only a necessity, it is the satisfaction of a primitive instinct. So it has become a pleasure. Of course this pleasure has been greatly increased and food values greatly heightened by the cooking and preparation of food.

Cooking makes food more digestible as well as more attractive. The discovery of cooking long, long ago, was one of the greatest landmarks in the progress of mankind.

The same intelligence that has given mankind such a wonderful help, convenience and gratification, can teach him to arrange his intake of food to the best advantage. This brings us to the whole subject of the relative values of food-stuffs, i.e. the study of diet.

The idea that the study of diet is difficult, because there has been much scientific examination of food and much elaborate talk about what food is good and what not, is not true and is not sense. The choice of the food you want to eat, or the food you ought to eat should be a matter of simple reasonable intelligence. For everyone knows that food can be harmful if too much be eaten, or the wrong kind, or if the food has gone bad; it can make the person who eats it ill; that is only common sense, and most people try to exercise common sense in the choice of food; no one eats putrid, smelling fish because they know it will make them sick, and no one gives a baby a mutton chop because they know quite well that the baby cannot eat it.

So it is quite easy to arrange food according to what should be eaten and at the same time according to what is nice to eat. The real reason why there is complaint and difficulty is because it is not easy under conditions of life in a city to get good fresh food; every housewife knows the benefit of country milk and fresh eggs, and how different they are from stale skimmed milk and old eggs, and yet it is difficult in a city and under all conditions of civilization to get the fresh food that common sense tells us is the best. Science has only explained why it is the best, and has only taught us the reasons which emphasize our common-sense choice.

Quantity of Food Required.—The first rule in taking food is to take enough. The body is like a fire in the grate: it will go out unless it gets more coal because it burns up the coal that is there; in just the same way we have to give the body enough food to burn up every day.

It is extraordinary to think how much work the body does. The heart beats and keeps on beating, pumping blood the same as an ordinary pump. If the work of the heart could be applied in a different way and used for lifting a man, then one day's work of the heart would be enough to lift a man as high as the highest mountain in England! And the heart is only one part of the body that keeps on working; all day, all night, resting, waking, standing, sleeping, the human machine goes on burning up fuel, so that a human being has to eat food and change it into this energy to keep himself alive. Scientists measure this change of the food in much the same way as we measure the amount of coal we need to put on the fire to keep it burning. They calculate how much food a human being needs in the day, and for convenience use as a unit of measurement the amount of energy given off by $\frac{1}{28}$-ounce of food (1 gram) when it is burnt. They call this unit of measurement a *calorie*, and hence can calculate how many calories a human being will need to live and to work. Of course, the number needed by different people will not be the same; a man lying in bed ill, or a baby, or an old woman, or a pregnant woman, or a full-grown man working as a labourer, will naturally want different foods and different amounts. A baby needs about 1,000 calories and a hard-working man about 4,000. For ordinary purposes most people need from 2–3,000.

Types of Foods.—The food taken is used for different purposes which can be conveniently divided into three: firstly, building up wear and tear, and repair of the tissues of the body generally; secondly, keeping warm; thirdly, the production of energy, that is to say, the power to do things. Food is divided into three types of substances which each are made for one or other of these purposes. First there is *protein*, which repairs

broken-down tissue and structure. Meat is nearly pure protein.

The food-stuff which gives heat is *fat.* The Esquimos in the far north eat enormous quantities of blubber—which is pure fat—because they need so much more of the kind of food to keep them warm than we do.

The third material, which gives energy, is called *carbohydrate* or *starch* of which the common examples are sugar and bread.

Proteins.—The meat type of food, that is to say the proteins, are essential not only for repairing the waste of the tissues which is always going on, but in addition are necessary for growth and for maintenance of healthy life, but they impose much more strain on the body in being burnt up. Too much meat is bad and harmful and brings illness. An ordinary person requires about a quarter of a pound of meat in the day. This is a fair allowance, and there is in scientific circles a tendency to think that even this is too much.

The composition of different kinds of meat is not the same either from the point of view of its food value or from the point of view of its digestibility. The most digestible form of meat is breast of poultry; beef and mutton are better than veal; and pork is the least so.

Protein is present in many other food-stuffs besides meat, but in some foods it is much more accessible and hence of a higher value to the individual. Consequently, smaller quantities can be eaten of the good protein foods to give the same protein value. The best proteins are found in milk, meat, egg and fish. Protein is also found in smaller quantities of a slightly different value in bread and some vegetables such as rice, but quantity of the latter will not compensate for the lack of quality. It may, therefore, be laid down as a rule that four ounces of meat is reasonable as a sufficient daily ration for an adult, and rather more for a growing child or a nursing mother.

Cheese has a good deal of protein as it is made from milk. It is important to remember that milk is almost the ideal food as it contains the protein, fat and carbohydrate in admirable proportions, and that its food-content is most accessible because it is so easily assimilated and causes so little expense to the body to burn up. Milk is in reality the best of foods and is infinitely superior to any other. Common sense tells us that we could live on milk alone, just as it tells us that to live on meat alone would soon make a person ill.

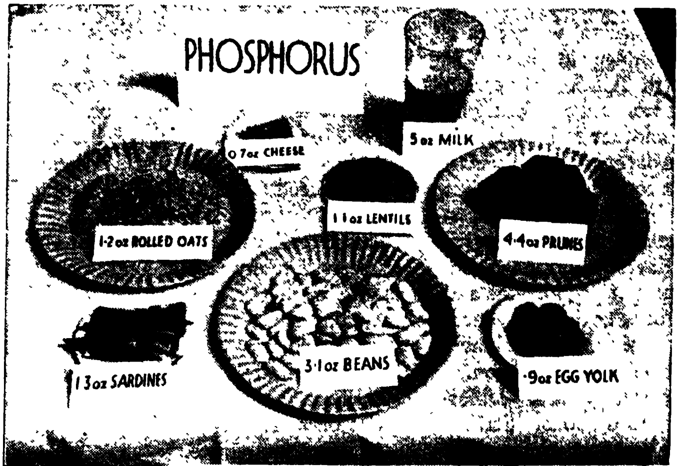
Fat.—Fat produces heat. Every living creature has to be kept warm, and this is done by the transformation of the food-stuffs into the actual warmth of the body, but the amount of heat required by different people under different conditions of age, work, climate, etc., will naturally vary. Fat is, moreover, apt to interfere with digestion, which justifies the popular belief that fatty foods are indigestible and make people bilious. Fat is not only present in the fat of meat, but can also be found as butter, cream, bacon, margarine, dripping, suet, lard and oil. It is also present in milk, where it is found in a most suitable and convenient form.

A proper daily intake of fat is necessary, but it is equally important that it should not be in excess and that it should be taken in as assimilable a form as possible.

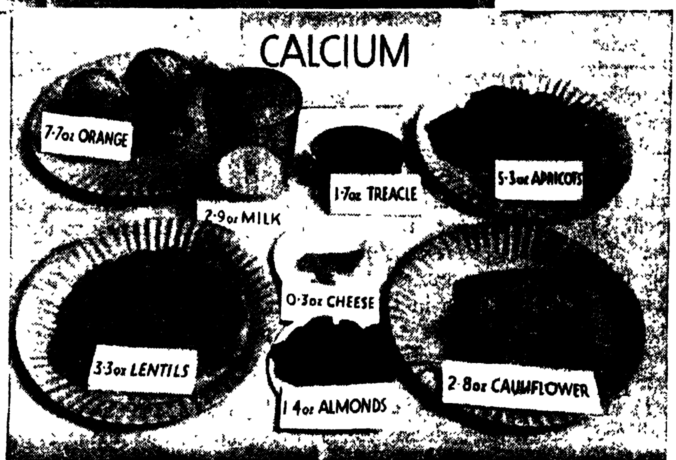
Carbohydrates.—The third group of food-stuffs, the carbohydrates, consists of the starch type, such as bread, potatoes and rice. This type of food makes up by far the larger part of the necessary daily intake, because a living creature has only a small amount of wear and tear of the tissues to replace and only requires a certain amount of heat, but is always expending a great deal of energy. The protein and fat may be compared to the iron and wood that make up a motor-car, and the carbohydrate or starch can be represented by the petrol which makes it go. We burn up fuel in every little trifling movement of the body—breathing eating, thinking—everything that is done by the living creature; even merely staying alive requires energy to keep the mere mechanical side going.

This is the scientific reason why a properly balanced diet contains much more carbohydrate or starch than meat and fat, and why bread is wisely and popularly called the "staff of life."

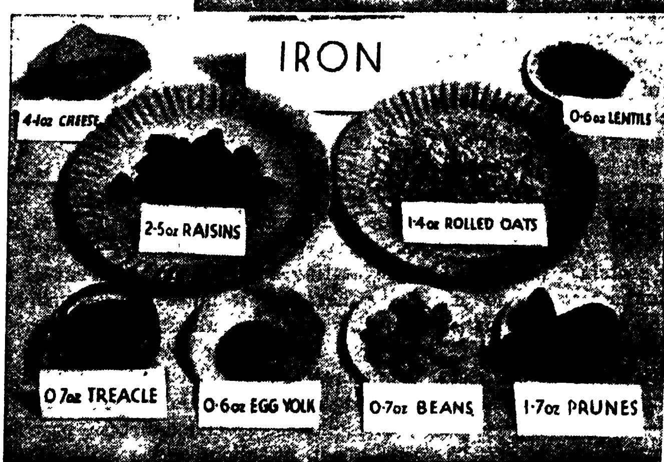
These starchy foods or carbohydrates are broken up in the process of digestion and converted into sugar, which is the most accessible and quickly used form of food. Sugar is transformed into energy faster than anything else and has the quality, in short, of being a quicker acting fuel. The common foods—which are principally made of



Each quantity of foodstuff represented contains one-tenth of the phosphorus necessary for one day's meals.



Each quantity of foodstuff represented contains one-tenth of the calcium necessary for one day's meals.



Each quantity of foodstuff represented contains one-tenth of the iron necessary for one day's meals.

carbohydrate or starch—are bread, porridge, rice, potatoes, sago, semolina, sugar; as a general rule good wholemeal bread is superior to white bread. A fair daily ration for an active adult would be about one pound of bread and another half-pound of cereal divided between oatmeal, rice, biscuits, etc. Sugar is the best source of energy, but should not be taken by itself in excess, as too much is only wasted and is apt to give rise to ill-health. Milk also contains carbohydrate or starch in proper proportions and in an advantageous form both as a source of energy and as possessing the invaluable quality of easy digestion and absorption.

Digestibility of Various Foods.—Differences in digestibility are obvious. Stringy fibre, such as tough meat or the stringy parts of vegetables, are less easily broken up and liquefied than soft tender meat or potato.

The easiest food to digest is milk, after which come milk soups and soft-boiled eggs. These take an hour or slightly more. Scrambled eggs, white fish, brain, sweetbread, potato, and toast take about two to three hours. Roast chicken, beef, mutton, ham, oatmeal, and cauliflower three to four hours. Pork, cheese, root-vegetables, peas, and beans about four hours.

This refers to digestion in the first part of the intestine which is the stomach; but equally important is the fact that only a certain proportion of the food material available in any food is actually absorbed and assimilated. Meat, for instance, yields practically the whole of its protein to the body, whereas only about three-quarters of the protein in vegetables is retained and made use of. That is one of the reasons why larger quantities of the vegetable food have to be eaten to get the same nourishment.

Necessity of a Balanced Diet.—No foodstuff can be considered from one point of view alone; a diet adequate and reasonable must be balanced; that is to say, it must have a certain amount of protein* (meat), a certain amount of fat, and a certain amount of carbohydrate (starch) material. This is very readily observed in the natural desire for different kinds of food; just as one can look at a piece of meat and judge how much one would like to eat, so Nature has provided us with the guidance of instinctive feelings which give us a real need for a proper proportion of different foodstuffs in our diet. This is the reason why personal cravings for one or other special food every now and then have a real justification in the genuine need of the body for some such fuel.

This necessity for a balanced diet varies, of course, with many special conditions, such as climate, work, sex, age, and personal idiosyncrasy, but average figures showing the quantities of the different foodstuffs necessary to the average individual have been worked out scientifically; the proportion may be stated as one part protein and one part fat to four parts of carbohydrate.

It has already been said that the food requirements for the individual can be measured in the term of a simple unit known as the calorie. The average number of calories required—about 3,000—has to be distributed as protein, fat, and carbohydrate in the proportions mentioned, but the calorie value of the food, that is the energy value afforded to the body, is decidedly different not only for the crude material of the foodstuffs, the proteins, fats, and starches, but for the different kinds of food which are made up of these materials in different proportions. Milk, for instance, consists of protein three, fat four and starch five, proportionally reckoned as a percentage of the total, the balance being water. Whereas sugar contains practically 100% carbohydrate, and bread contains 51% carbohydrate and 7% protein Egg contains 15% protein and 10% fat; beef contains 27% protein and 24% fat. It will therefore be evident that a diet to be balanced must contain the proper amount of the different food materials; that these have to be in a conveniently available form and, moreover, palatable and easily digested, necessitating a careful arrangement of the daily diet; but it must not be imagined that it is at all difficult, for all that is really required is a proper proportion, and the common sense that tells everyone the dangers of eating either too little or too much.

The following specimen diet (*see* page 805) works out at about 3,000 calories and would contain all the simple elements of the food in proper proportions, the amounts

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*** Note.—For simplicity meat and protein are herein used as interchangeable terms; this is not absolutely accurate though for obvious reasons convenient. (*See table* No. 1.)**

being the ordinary average amounts most people take. This adjustment of different quantities of various foods provides the source of energy, heat and repair of waste.

What should never be lost sight of is the real need to mix the foodstuffs in accordance with the special requirements of the individual. The total energy value of the food taken should be equal to the work performed, and where necessary should allow for growth or storage, just as the type of food taken should be varied according to the capacity of the digestion.

Minerals.—But the balance spoken of necessary for a healthy sane diet has not covered everything yet. No mention has been made of **salt**. Now salt is only one of the minerals which must be taken into the body regularly. Mineral matter is an essential part of all the tissues of the body. Salt is needed for all the organs, every nook and cranny, every little cell in the body. Iron is needed for the blood; phosphorus for the nervous system; lime for the teeth and bones; and many others for many other different duties. Any shortage of one or other very quickly brings ill-health, more particularly in growing children.

It is quite possible to arrange a dietary which hardly contains any minerals or essential metals such as iron at all. Sugar and fat, for instance, contain none; meat and white bread contain very little; the boiling of vegetables takes away nearly all their mineral salts. Raw vegetables and raw fruits are rich in these mineral elements and are the common source of their supply. Hence their importance as regular articles of diet. But they must be raw. Vegetable soups are not only palatable and pleasant but also contain the minerals. Milk contains all the essential ones except iron, so that again science tells us why milk is the best food for babies, and explains, as only science can do, the reason for this working of Nature. On the other hand too much salt easily becomes a bad habit and can do serious harm. The golden mean is always the best way.

Roughage.—Food when taken into the body has to be transformed by digestion and broken up into its component parts so as to be absorbed and made use of. But there are certain foods or parts of foods which cannot be broken up and assimilated. And this is rightly so, for some ballast or "roughage" is required to carry forward the food in the long, slow passage through the intestine. This roughage acts as packing or support and provides something for the intestine to get a grip of. Such "roughage" comes mostly from the coarse fibres of vegetables and fruits, and this undigestible fraction is known as *cellulose*. It is invaluable as a necessary part of a balanced diet, giving the required bulk, stimulating the intestine and digestion, and preventing delay and constipation.

Excellent samples of this are turnips, marrow, cabbage, and apples. Some others contain rather too much roughage and so require extra chewing, such as carrots, celery and cucumber.

Vitamins.—Another and more curious property of diet remains to be discussed—*vitamins* or accessory food substances. They are chemicals of a rather elaborate nature. Quite a number, about eight or nine, having different uses and values, have been found and their discovery has solved the causes of several diseases such as rickets. Moreover, they are intimately bound up with the maintenance of ordinary health and vigour and are absolutely essential to life.

Curiously enough they are only formed by vegetables. Animals have to get them from the vegetable food they eat. They make use of these vitamins for themselves and store them in their tissues. All the vitamins are present in fresh milk, provided the animal from which the milk has come is itself getting enough.

These accessory food substances, so very necessary to every living creature, and above all to the young, are very nearly destroyed by any form of cooking, such as boiling vegetables, or curing meat. Such prepared foods are altered by the cooking for the worse and are lacking in the nutritive value normally present. This point is important, as it explains the reason why fresh food every day is a real necessity for everyone.

The vitamins are present in their greatest quantities in fresh food, such as oranges, tomatoes, lemons, vegetable soups, carrots, spinach, cabbage, lettuce, peas, egg-yolk, and yeast. The arrangement of them varies, different articles having different kinds, but they are never present in old, over-cooked, stale, tinned, preserved or twice-cooked food. Fresh food daily, fresh milk daily, fresh fruit daily, is needful not only to

health, but to keep off the ill-health that at once follows any shortage. Many people are not ill, but only in a poor state of health, without anything definitely wrong with them, simply from a lack of balance in their diet, which nearly always resolves itself into a lack of sufficient fresh food.

Water in the Diet.—Last, but not least, comes the important and essential fact of water. No diet containing an inadequate quantity of fluid can be regarded as balanced. Water distributes throughout the tissues the food elements; it dissolves the foodstuffs and transports them through the body to the point where they are required; it keeps them there in such solution as is wise; it washes through the entire system and carries away impurities of all kinds. A liberal daily intake should be a regular habit. Six large tumblerfuls a day is about the proper amount. There is no reason why it should not be taken as weak tea or weak coffee; strong tea or coffee is bad for everyone, but taken weak it imparts a pleasant taste to the fluid, and is slightly nutritious from the milk and sugar it contains. No one should ever be thirsty for any time. An ordinary human being can live thirty or forty days without food, provided he has plenty of water, but only three or four without any water at all.

The body itself is very largely water—no less than 85%—and the great part of all foodstuffs is composed of water.

The table (No. 1) on page 805 shows the percentage of water in some common foodstuffs, and shows how much of their bulk is really only water and how little actual solid there is in any animal or vegetable substance. It is only in fat and fatty foods that water is nearly absent, for fat and water do not mix.

Although it will thus be seen that the food consumed is largely water, still a right and proper quantity must be drunk every day; this is more essential in disease than in health.

Summary.—Food is composed of seven different substances—protein (meat), fat, carbohydrate (starch), mineral salts, roughage, vitamins and water. All are necessary in due and proper proportion, if the human engine is to do its daily work. The more careful and sensible the diet, the more attention given to a careful balance, the more fit and healthy will a human being be. Quantity, quality and variety must also be considered.

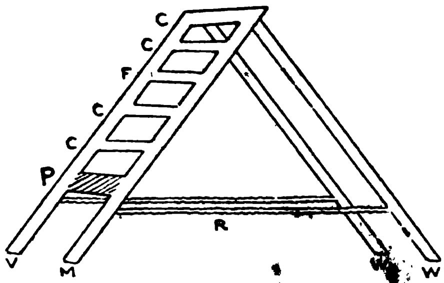
Cooking food increases digestibility, makes food more suitable and palatable, and allows greater variety of foodstuffs, but it has the defect of increasing the attractiveness of feeding. It makes food more of a pleasure and less of a duty.

An ordinary adult man should keep about the same weight from 25 to 45, but how many do? Why? Because they eat and drink too much, lead too sedentary lives and, in short, think of their bodies as obedient slaves, as punctual and efficient as a railway train, and needing much less thought or care than a motor-car.

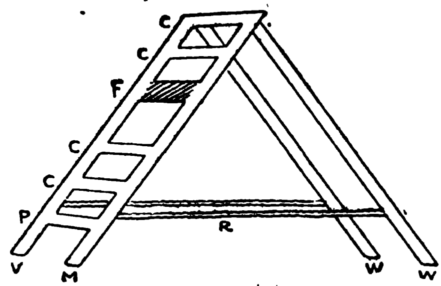
Over-eating under civilized conditions is much more common than under-eating.

The Ladder of Health.—The secret of health, long life and happiness may be summed up in the balanced diet.

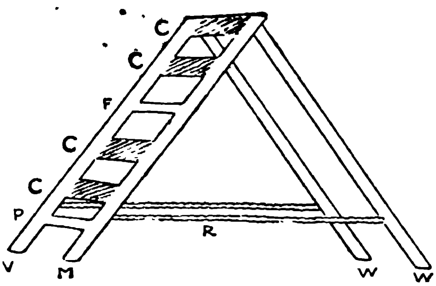
This balancing of food-stuffs may conveniently be imagined as the step-ladder to health. The first step is protein, i.e. meat-stuffs. It is the builder, the repairer of waste, the basis of most living tissue; hence the first step must always be the protein. Now heat is also essential, and so fat comes in properly about the middle, as important but not as immediate. It can only follow, not lead. The house must be built before the central heating is put in. Both meat-stuffs and fat have to be broken up and dissolved by the digestion for the body to make use of. That means work, or energy expenditure on the part of the body in breaking up the meat-stuffs and fat into convenient packets to pass around to the different parts of the body where they are needed. Hence the necessity of four parts of carbohydrate to one part of protein and one of fat. The meats and the fats are burnt up in the fire of the starches. We all know that, for we naturally eat more bread and potatoes and cereals than we do meat or fat. An ordinary dinner is some soup with a piece of bread, some meat with a little fat, potatoes and green vegetables, and a plain pudding. The protein is the meat; the fat is the fat with the meat; and the bread, potatoes and pudding are all starch or carbohydrate. Hence scientific work and talk about balance only emphasizes and explains what we know already and what most people naturally do. It does not need me to tell you that a dinner of bread alone is not sufficient, and that a dinner of meat alone is stupid,



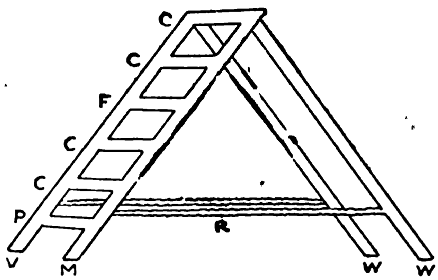
Excess of Protein



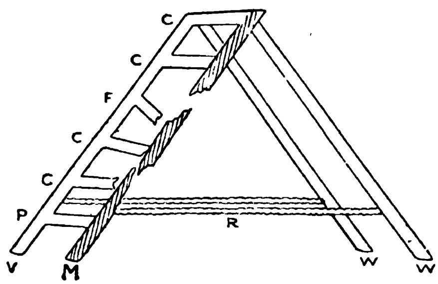
Excess of Fat



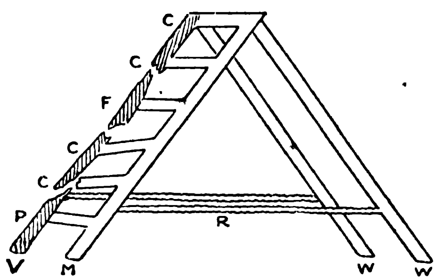
Excess of Carbohydrate



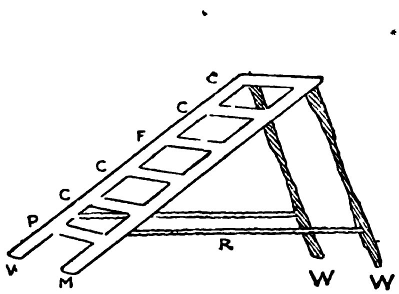
Normal True Proportions



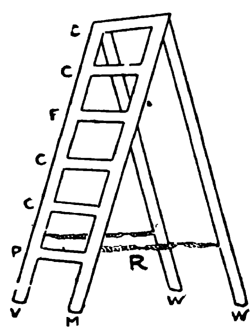
Lack of Mineral Salts



Lack of Vitamins



Lack of Water



Lack of Roughage

LADDER OF HEALTH

P—Protein. C—Carbohydrates. F—Fat. V—Vitamins. M—Mineral Salts. R—Roughage. W—Water.

or that a dinner of fat alone is sickening. Thus the step-ladder of health has six steps; the first protein, then two carbohydrates, then one fat, and then another two carbohydrates—so making six steps upwards.

But the steps alone do not make a ladder; they must be held together by uprights and supported at the back so as to stand upwards.

What holds the steps together as essential parts of the food-stuffs are, on the one side, the vitamins, and on the other the mineral salts. These are necessities of life and must be there to keep the steps of the food-stuffs together. No vitamins and mineral salts—no life; no side pieces—no ladder.

But the steps have to be held up, so we may put the great need of life—the substance present in all food-stuffs, the substance that makes us, each living creature, 85% of us—water. Water must be there just as the back support must hold up the steps, and it is just as important as all the steps put together; so we put water as the back legs of the step-ladder.

Now the front steps of the food-stuffs and the back legs of water must be held together or they will fall apart and never stand, so we add a cross-bar of roughage, which is not useful in itself, and not such an essential, but keeps all the others in sensible harmony and helps to hold them all together to make a real step-ladder of health. It is like the ropes that hold the front and the back together.

Now observe the application and the use of the different parts, how one helps the others and how all together combine to make up a real step-ladder of health, up which anyone can climb in ease, comfort and safety.

There can be no ladder without the steps; if they are broken or irregular or missing, how difficult it makes it to get up, or even impossible. If the protein (meat-stuffs) is too much, what a big step to start with, and perhaps too big, too difficult for any of us. And the same with the fat-step; the steps must be even, strong and secure, and a proper distance apart—a proper balance. If the protein is not "good" protein, the step is broken and cracked and we cannot climb over it except with effort, trouble and danger.

If the fat-step is too big we cannot reach up such a long way, and get stuck half-way up. How can there be health if anyone eats too much butter and grease and oil and fatty things? If the carbohydrates are not there, then there is no sixth step up and no top to the ladder. Then it is no use climbing up the protein (meat) step or the fat-step if there are no more steps and it gets us nowhere, as happens when the arrangement of foods is short of carbohydrates (starches) which are necessary to burn up and use the proteins and the fat.

Then the side-supports, the vitamins and mineral salts. Complete absence of either is certainly unusual, but deficiency or shortage of them is very common from lack of fresh food, fresh fruit, fresh vegetables, too much cooking of the food, old, tinned, preserved or twice-cooked food. So then you see the ladder would be lop-sided, insecure, unsafe and useless, as any form of feeding must be which does not provide the proper quantities of these important substances, the accessory food-stuffs and the mineral salts.

At the back is the back support of water. That is an integral part of the ladder—something must keep it up. Everyone knows how necessary, not only to health but to life itself, water is: it justly takes the important place of holding up all the rest, as is its duty and purpose in life.

Then the cross-bars of roughage. If too short, i.e. if insufficient roughage be taken then the ladder will still stand up all right, but will not be safe and secure and steady. It has to be propped open to a sensible safety and steadiness and security, and held together by the coarse ropes of roughage, which act as such a help in food-stuffs. Deficiency—one rope broken—while not vital like the others, makes the ladder possibly useful and good enough, perhaps, but not really safe and sound. Adequate roughage is easily obtained, easily taken and easily used.

Supplementary to these remarks are given suggestions for the ordinary average diet. Read them. Think truthfully what exactly you yourself eat every day and have eaten to-day. Is it duly and properly arranged, mixed, balanced, not too much meat nor yet too little; not too much bread and potato (starchy foods), nor yet too little; and above all, has it enough green vegetables, raw fruit and fresh food?

Special mention should be made of one important food-stuff—*milk*. It is really the first article of diet: it is the food we start with; it should never be omitted all our lives, and it should be the last we take. It

contains "good" protein, fat in a soluble assimilable form, carbohydrate, and about 87 per cent. water; so that it provides everything and can suffice alone for anybody.

It is accepted by everyone as the proper food for the baby; it is generally agreed that every growing child should drink a tumbler of milk every day, as well as taking milk with tea, cereals, pudding, etc. Every adult should get at least a tumblerful, though it may be taken other than as a beverage. It is advisable that the amount should be greater both for the child and the adult.

Digestion.—Having spoken of these important aspects of food-stuffs one more requires to be referred to. It is of no use at all considering the simple rules of proper diet unless due attention is given to digestion.

This may wisely start with elementary rules. Food should be eaten slowly, quietly, and in peace. "Slowly," which means it must be chewed well. Insufficient chewing is a great and common error; food is bolted down hastily and hurriedly and the poor stomach is expected to be able to handle large lumps and masses of coarse food. As digestion actually starts with the saliva in the mouth, the need for slow regular steady chewing is only further emphasized.

Quiet is essential. Noisy chattering at meals takes the attention away from the food; too much is eaten and it is taken too hurriedly. Conversation at meals may be pleasant within reason, but should be made to slow down the taking of the food, not to hurry it.

Peace is essential. No one need be told how worry, anxiety or annoyance takes away the appetite and spoils the meal. Moreover, it does actually interfere with digestion, because the mental stress and strain reacts on the body, which gets upset and irregular in its working and cannot do its duty. Just as the hand gets shaky and the face red in anger, so the stomach and intestines, though not visible, change somewhat and cease to do their work properly.

Digestion changes the solid food into liquid form, so that as it passes down the intestine it is brought in contact with the walls which absorb from it just what the body needs. Most food, of course, is used to give the body energy and heat, but some has to go off to various parts to provide for growth and wear and tear. This breaking down of the food is done by various ferments. Too much food taken at a single meal causes discomfort or pain, or vomiting or diarrhœa, simply because there is not the capacity to do the work. Hence, meals ought to be spaced out regularly, so as to give the stomach and intestines a rest sometimes. It is doubtful under ordinary conditions of city life if the stomach is ever really empty except in the early hours of the morning.

Food should never be taken at irregular times. Two, or at the outside three, meals a day are ample. It is wise to eat a good breakfast in the morning, and a good meal in the evening after the day's work, and to make any meal taken in the day very light, e.g. a sandwich and a cup of coffee or tea. The evening meal should be two hours before bedtime.

Many people, however, prefer a light breakfast (fruit, rolls, butter and coffee), and a heavy lunch in the middle of the day. The practice is not so good as the other, but allowance must be made for personal idiosyncrasy.

Cooking should always be plain. Heavy, oily, greasy, made-up dishes are more indigestible, mean more work for the stomach, and do not contain the nourishment they should. Over-cooked foods have little or no value. Plain and fresh food is the golden rule.

The arrangement of the food followed in the meal menu is good and wise. Take an ordinary dinner: it usually starts with soup, e.g. meat or vegetable extract very diluted. This is of slight nutritive value, but is stimulating to the stomach, encouraging it to secrete its juices; and it is better that fluid should be taken first and not last. Next follows fish or meat (both proteins) with green vegetables (vitamins, mineral salts and roughage) and potatoes (carbohydrates); last of all, stewed fruit or pudding, nearly always pure carbohydrate and fresh fruit.

The habit of taking liquid with solid food is ordinarily harmless; but it should be remembered that the food-stuffs are themselves largely water, and that it is better not to dilute the gastric secretion more than is necessary. It is wise to drink a large tumbler of water first thing in the morning and last thing at night. This flushes out the system and quenches thirst. Liquid is best taken half an hour before or two hours after food.

It is further essential that waste matter

should be got rid of; adequate daily evacuation, getting rid of surplus unnecessary or waste material, is essential to health.

Common Foods.—Some of the common foodstuffs:

Meat: 4 oz. (i.e., a quarter of a pound) is sufficient daily for an adult or a growing child. Cheaper cuts of meat are just as nutritious as the more costly ones, and only inferior in flavour and in tenderness (i.e. digestibility). Liver, heart, and tripe are all good purchases. Bacon has three times more energy in it than lean meat, and the fat is usually more palatable than most. Eggs are exceedingly nutritious, very digestible and have valuable vitamin and mineral salt contents. All children should get at least one egg a day.

Fish is another good source of protein, but the more digestible forms are not so nutritious as some of the others. Whiting is suited to an invalid.

Cheese is made up of protein with fat. While definitely difficult to digest, its nutritive value is very high. Fresh cream cheese is the best.

The common source of fat in the daily menu is butter, which is nearly pure fat and easily digestible. Margarine is lacking in vitamins but is about half the cost of butter, so if vitamins be added or served in the rest of the diet it is for all practical purposes just as good. Fat is also got from milk, cheese, suet, and lard, but the latter two are not easily digested.

The starchy foods are principally bread, porridge, cereals, sugar and puddings. The amount in vegetables and fruits is not so available on account of their high roughage content. Porridge—the coarse oatmeal porridge of Scotland—is nutritious and digestible and well suited to growing children.

Bread is rich in carbohydrate and protein, is cheap, and, curiously enough, no one ever seems to get tired of it as one does of so many other things. We eat bread in one form or another three or four times a day all our lives. An ordinary adult needs about four fair-sized slices in the day (about 10 oz.).

Sugar is only too easily taken in excess. It is pure carbohydrate and is about the highest energy-producing food in a most assimilable form. It should not be taken to excess, i.e. more than about four tablespoonfuls a day. Glucose is the best form.

Vegetables and fruits are of low energy value and poor body-building quality. It is for their freshness, i.e. their vitamin content, and their cellulose, i.e. roughage, that they are valuable.

The most nutritive are bananas, prunes, potatoes, and plums. Fresh vegetables and fresh fruit are essential to everyone about twice a day. The old saying of "an apple a day keeps the doctor away" is a true one. Growing children and old people need them particularly.

Children are growing all the time, hence they require more building-up or protein type of food, but that does not minimize the greater need for balance and particular features in their daily diet. They have not only to build up but they have to build up right, which means right habits of body and mind.

A certain adjustment or re-arrangement is necessary at different periods of life. This applies both to quantity and to quality. As already said, people over forty do not need to eat anything like the quantity of food required by those under thirty. The tendency in middle-life is towards enjoyment of the pleasures of the table. This bad habit most often means too much meat. In middle-age it should be reduced to only once a day, the actual quantity taken being reasonable.

In later life, i.e. after fifty, again reduce meat, sugar next, bread and pastries next, no extra helping of puddings or sweets; and later on butter or cream should be knocked off. The aim in mind should be to rise gradually to a maximum at thirty-five; after that the process should be reversed and the intake reduced, aiming at the simplicity of childhood, and remembering that old age *is* a second childhood, and should be dieted accordingly. A man at seventy requires about half the food-value of a man of thirty-five; less, indeed, than a child of twelve.

Various Diets.—The arrangement of diets as shown in the table on p. 805 is done according to a carefully worked out estimate of the actual food energy required for the daily work of the individual.

The food elements give different values in being burnt up by the body. One ounce of protein produces about 116 calories; one ounce of carbohydrate about the same; but one ounce of fat about 263.

Diet can thus be technically worked out according to the calories required, the calories produced by the different elements in the different food-stuffs, and the proportion necessary of these elements.

Wide experience, resulting from careful investigations of an elaborate nature in many parts of the world, has shown that the average man feels the need of, and is reasonably satisfied with, a dietary of the value of about 3,000 calories. Arranged as one part of protein, one of fat, and four of carbohydrate, he will thus take about as follows:

3½ oz. protein	406 calories
3½ oz. fat	920 calories
14 oz. carbohydrate	1624 calories
Total	2950 calories

This allows for tissue repair, heat production and energy output. It gives adequate value with judicious balance of the respective elements, and may be regarded as suitable for an average man not doing heavy work.

Diet No. 2 is based on the above figures, taking into consideration a certain economy.

Diet No. 3 is rather more generous—about 3,400 calories—both in scale and in expense. It is assumed in all the diets given that ordinary portions are taken, except where otherwise stated.

Emphasis has been laid on balance of the different constituents and on the importance of moderation. In contradistinction it may be noted that an average growing boy of say sixteen would certainly need 3,000 calories and could well do with more. A labouring man or anyone taking heavy muscular exercise would be able to burn up 4,000–4,500 calories. The important factor involved is the actual output of physical energy.

A woman, whose physical life is naturally on a lower plane, or the ordinary city man leading a sedentary life, only requires 2,500 calories or less, as in Diet No. 4, which allows about 2,400.

[Figures extracted from "Food," by Hutchinson & Mottram; decimal points and other components omitted.]

No. 1. COMPOSITION OF COMMON FOODS (in percentages)

	Protein	*Fat*	*Carbohydrate*	*Water*
BEEF	27	24	—	46
MUTTON	29	27	—	40
FOWL	24	7	—	67
SAUSAGES	11	18	15	53
HERRING (salt)	19	17	—	46
COD	16	1	—	83
HADDOCK	17	1	—	82
BUTTER	—	82	2	15
CHEESE (Cheddar)	33	27	—	32
EGG	15	10	—	74
BREAD	7	1	51	40
OATMEAL	15	10	65	5
POTATOES	2	—	18	78
CARROTS	—	—	10	86
TURNIPS	1	—	5	90
ORANGE	1	—	9	87
APPLE	—	—	13	82
CABBAGE	2	—	6	90
TOMATO	1	—	5	92
MILK	3	4	5	87

No. 2. SPECIMEN DIET FOR AN AVERAGE MAN
(*Giving about* 2,800 *Calories*)

BREAKFAST—
Plate of porridge with 3 oz. milk, and sugar if required. 1 egg; 1 rasher. 3 oz. bread. 1 oz. marmalade. ½ oz. butter. Tea with 1 oz. milk; sugar, if required.

LUNCH—
3 oz. bread. ½ oz. butter. 1 oz. cheese. Coffee with 3 oz. milk; sugar, if required. Fresh fruit (apple, pear, or orange.)

TEA—
Tea with 1 oz. milk; sugar. 2 biscuits.

DINNER—
Soup. An average portion of lean meat. 6 oz. potatoes. 2 oz. green vegetables. Milk pudding with stewed fruit. 1 oz. bread.

Note.—1 oz. bread is a piece ½ inch thick and 3½ inches in size.

No. 3. SPECIMEN DIET
(*Giving about* 3,400 *Calories*)

BREAKFAST—
Cereal food with 3 oz. milk and ½ oz. sugar. Tea with milk and sugar. 1 egg; 1 rasher of bacon. 3 oz. brown bread. ½ oz. butter. 1 oz. marmalade, honey or jam.

LUNCH—
Coffee with milk and sugar. 3 oz. bread. ½ oz. butter. 4 oz. cold meat or sausage. Salad. 1 oz. cheese. Biscuit.

TEA—
Tea with milk and sugar. 2 oz. toast, biscuits or cake.

DINNER—
Soup. 2 oz. bread. 4 oz. meat. 6 oz. potatoes. 4 oz. green vegetables. Custard or simple pudding. Coffee with milk and sugar. Fresh fruit (apple, orange, pear, etc.) to be taken during the day.

No. 4. SPECIMEN DIET FOR A WOMAN OR A MIDDLE-AGED MAN
(*Giving about* 2,400 *calories*)

BREAKFAST—
Cereal food with milk and sugar. Tea or coffee with milk and sugar. 2 oz. brown bread. ½ oz. butter. 4 oz. fish. Honey or marmalade.

LUNCH—
1 oz. bread. 1 egg. Salad. Coffee with milk and sugar. Fresh fruit (apple, orange, pear, etc.).

TEA—
Tea with milk and sugar. 2 oz. bread and butter.

DINNER—
Clear soup. 1 oz. bread. 4 oz. meat. Green vegetables or salad. 4 oz. potatoes. Stewed fruit. Coffee with milk and sugar. Biscuits; ½ oz. cheese; butter.

No. 5. MILK DIET

Milk diet is milk alone. The total quantity required is from three to four pints. It is made more digestible by diluting, half and half, with soda-water and adding two tablets (gr. 5) of citrate of soda to each tumbler. It may with discretion be flavoured with tea, coffee, meat extracts.

No. 6. FLUID DIET

Water, soda or mineral water. Weak tea. Milk (as in previous diet). Egg whites, egg raw, beaten up. Meat extracts. Beef, mutton, veal or chicken "tea." Fresh fruit juice. Thin clear soups. Rice-water, barley-water, lemonade.

Certain points should be noted in giving diets which are meant for the sick.

Plenty of water should be given.

Feeds should be small and frequent, about every two hours.

Every effort should be made to make the food attractive by judicious variation and by dainty service.

The patient should always be encouraged to take a fluid diet with a spoon, or at any rate, slowly, for he must not gulp it down.

No. 7. LIGHT OR BLAND DIET
(Giving about 2,300 Calories)

ON WAKING—
Weak tea with sugar and milk; or fruit juice in water.

BREAKFAST—
Half a tumbler of milk (*see* below). An egg beaten up, with or without a few drops of flavouring or alcohol. A thin rusk and butter.

11 a.m.—
Half a tumbler of milk, as above. A rusk and butter, if desired.

LUNCH—
Steamed fish (small portion). A rusk or "split" toast and butter. Plain custard (egg and milk). Fruit juice in water; or lemonade.

TEA—
Half a tumbler of milk, as above. Two rusks and butter. Beaten-up egg or meat extract.

DINNER—
Steamed fish. Purée of spinach or tomato. 1 or 2 rusks of "split" toast with yeast extract or butter. Custard, plain; or junket. Orange juice (2 oranges) in water.

AT BEDTIME—
Half a tumbler of milk.

Note.—The milk should be diluted with water, soda-water, weak tea or weak coffee; or may be flavoured with meat extract or a few drops of vanilla. It should be sweetened with glucose, and may be given warm or cold.

INVALID COOKERY.—In certain fundamental principles Invalid Cookery differs from ordinary cooking. In the first place the invalid's diet is chosen by the doctor so as to give most nourishment with least strain on the digestive organs. This principle must also be applied to the way the food is cooked. Steamed, stewed, or baked dishes are preferable to fried or roasted ones. Secondly, invalids are generally more conscious of flavour than healthy persons are. Their food must, therefore, be very carefully prepared, in glass or earthenware vessels for choice. The quality of the materials used must be beyond suspicion. Neglect may give to the food a faintly disagreeable flavour, unnoticed by a healthy palate perhaps, but enough to disgust the invalid's already feeble appetite. Thirdly, only small quantities should be given at a time. Little and often is the rule for sick-room feeding and a patient will sometimes readily swallow a small helping when the sight of a more generous allowance would revolt him. Fourthly, let the dish be daintily served and as varied as possible. An invalid's appetite needs coaxing and a badly-cooked meal, slovenly served, will simply repel.

Other points to observe are punctuality. A weak patient's strength flags if the meal is late. A convalescent looks forward to meal times and is impatient of any delay.

Never leave food standing by the bedside. Any food left over should be removed at once. In cases of nausea, iced food can often be kept down where warm foods are returned.

Where variety of diet is not permitted, new patterned crockery or a different tray will lend a fresh aspect to the meal and help to avoid monotony. All utensils must, of course, be kept scrupulously clean. Where a feeding-cup is used it is a good plan to keep two, one for milk and another for broth. The cup used for milk should be kept in cold water; the other should be scalded.

In infectious diseases all surplus food must be burned. On no account should a healthy person be allowed to taste it.

Crumbs can cause the patient great discomfort. Every care should therefore be taken to exclude them from the bed. Similarly, a slopped saucer will cause drops on the sheet every time the patient lifts the cup to his lips. If the cup has spilled a little, stop and dry the saucer and bottom of the cup.

A tray is difficult to manage in bed and a

proper bedside table, which stands on the floor and swings across over the bed, is most desirable for a long illness. Failing this, a bed-table with short legs which rest on the bed can be bought for a few shillings.

Other conditions being equal, the patient who is carefully fed and properly nourished will make the quickest and best recovery.

Beverages.

1. ALBUMEN WATER. Take white of one egg, 3 tablespoonfuls of water, salt or lemon juice to flavour.

Method.—Whisk white to a stiff froth, add water, cover, and leave till all dissolved. Add flavouring.

N.B.—Given for typhoid cases or where milk cannot be easily digested.

2. ALBUMENIZED MILK. Take white of one egg and half a pint of milk.

Method.—Place the egg and milk in a covered glass jar. Whisk it to blend the ingredients thoroughly. Sweeten and flavour to taste. Serve at once.

3. ALMOND RESTORATIVE. Take six bitter almonds and 2 oz. of sweet ones.

Method.—Blanch and peel the almonds. Pound to a paste with a little cream, then slowly mix in a pint of fresh milk. Strain and sweeten.

N.B.—Very nourishing.

4. BARLEY WATER. Take 2 oz. of pearl barley, 1 pint of boiling water, three lumps of sugar, the thinly pared rind of half a lemon.

Method.—Boil the barley for two minutes in sufficient cold water just to cover it. Strain off the barley into a jug and add the sugar and lemon rind. Pour in one pint of boiling water, cover, and leave to stand. When cold strain and use.

N.B.—This is a pleasant, slightly nutritious drink and a good thirst-quencher.

5. BLACK CURRANT TEA. Take 1 dessert-spoonful of black currant jam, ½ pint of boiling water, 1 teaspoonful of lemon juice, sugar to taste.

Method.—Put the jam, sugar, and lemon juice into a jug. Pour on the boiling water, stirring well. Cover and leave in a warm place for twenty minutes, then strain.

N.B.—For a cold, drink while still hot. As a remedy for hoarseness and to quench thirst, allow to cool before taking.

6. BRAN TEA. Take 1 pint of wheat bran, 1 quart of boiling water.

Method.—Pour the water on to the bran and stand where it will keep warm without boiling for an hour. Strain and serve with cream and sugar.

N.B.—This makes a pleasant and nutritious drink.

7. LINSEED TEA. Take 1 oz. of whole linseed, ½ oz. of liquorice, ½ oz. of sugar candy, 1 pint of cold water, the juice and rind of half a lemon.

Method.—Wash and drain the linseed, add water, liquorice, and lemon rind, and simmer for half an hour. Strain, stir in the lemon juice and sugar candy.

8. NUTRITIOUS COFFEE. Beat up the yolk only of an egg with the warm milk to be used in the morning coffee.

9. OATMEAL WATER. Take ¼ lb. of oatmeal, 3 quarts of water, and 1½ oz. of sugar.

Method.—Boil for one hour, shake well but do not strain before drinking.

After exercise in summer this makes a refreshing drink taken cold. Taken hot in winter it is fortifying and nourishing.

10. RHUBARB WATER. Take one stalk of rhubarb, 1 quart of boiling water, 4 oz. of sugar.

Method.—Do not peel the rhubarb. Cut it in thin slices, add sugar and boiling water. Keep closely covered for one hour; strain and serve. This is a cheap and useful drink for fever cases.

11. RICE WATER. Take 1 oz. of unpolished rice, 1 quart of cold water, and flavouring.

Method.—Wash the rice well in cold water. Add the quart of water and soak the rice therein at tepid heat for three hours. Bring to the boil and allow to simmer for one hour. Strain and flavour to taste.

This beverage is useful in cases of dysentery, diarrhœa, etc.

12. TOAST WATER. Slice off a piece of bread crust and toast it hard and brown, taking care not to burn. Soak for one hour in a jug with one pint of water, strain and use.

13. WHISKED WHITE OF EGG. Beat up on a china plate the white of a new-laid egg until very stiff. Add a little powdered sugar and a trace of lemon juice.

This is very sustaining.

Broths and Soups.

14. CALF'S FOOT BROTH. Take 1 calf's foot, 3 pints of water, sugar, salt, lemon rind, yolks of eggs, milk.

Method.—Stew the foot in the water for three hours, then strain into a basin. Allow to cool and remove the fat. Add salt, sugar to taste, and lemon rind to flavour. To each ½ pint of the liquid allow ½ gill of milk and 1 yolk of egg. Stir beside the fire until the broth thickens. Do not let it boil or it may curdle. Skim off all fat carefully and serve.

15. CHICKEN BROTH. Take 1 chicken, 3 pints of water, 1 oz. of rice, 1 carrot, and 1 onion sliced.

Method.—Put the chicken and vegetables in the water and gently simmer for 2 hours. Strain off the liquor, cut up the carrot and the breast of the chicken into fine pieces, and re-heat the broth. Add the rice, previously boiled, the chicken meat, and carrot. Season to taste and serve.

16. CHICKEN ESSENCE. Remove the meat from 1 chicken, shred it coarsely, and break up the bones into small pieces. Place the meat on top of the bones in a stewpan, sprinkle with salt and add ½ pint of cold water. Cover and cook gently in a cool oven for 4–5 hours. When cooked, press out all liquid and after allowing to cool, carefully remove every particle of grease. Season to taste, and serve either hot or cold.

This is a highly concentrated food and should be given in small quantities.

17. COW HEEL STOCK. Take 2 cow heels, split them, remove the fat, and wash well in warm water. Put them into a stewpan with 3 quarts of cold water. Bring slowly to the boil, removing any scum, and simmer gently for 5–6 hours. Strain into a basin and when cold remove any remaining fat.

This is a more economical stock for jellies than calves' feet.

18. EEL BROTH. Take ½ lb. of eel, 3 pints of cold water, and half a small onion.

Method.—Clean and skin the eel, cut it into small pieces, and place in stewpan. Add the water, onion, and seasoning to taste. Simmer gently for 2 hours, skimming occasionally. Strain into a basin and when cold remove all fat. Re-heat and serve the quantity required.

This is easily digested and very nutritious.

19. ESSENCE OF MUTTON. Finely shred 1 lb. of lean mutton, place it in a jar with ½ gill of cold water and cover. Place the jar in a pan of boiling water and allow to simmer gently for 2 hours. Strain out all the liquid from the meat, and season.

This is very suitable for convalescents. Only a small amount should be given at a time, as it is very concentrated and savoury.

20. MUTTON TEA. This is a useful alternative to beef-tea to give the diet variety. It is prepared in the same manner as "Beef Tea" (q.v.) using ½ lb. of lean mutton to ½ pint of water and ¼ tablespoonful of salt.

21. RESTORATIVE SOUP. Take 1 lb. knuckle of veal, 1 lb. neck or knuckle of mutton, 1 lb. shin of beef, 2 quarts of cold water, and 1 teaspoonful of salt.

Method.—Cut the meat up, removing all fat and skin. Put these into a pan with the water and salt. Remove the marrow from the bones and add them to the other ingredients. Cook slowly to boiling point and simmer for 3 hours. Skim and strain. When cold remove all fat and re-heat to serve.

This soup may be thickened with rice, sago, tapioca, arrowroot, or cornflour, allowing 1 teaspoonful of grain to ½ pint of stock.

22. TAPIOCA CREAM SOUP. Take 1 pint of veal or chicken stock, 2 yolks of eggs, ½ gill of cream, 1 tablespoonful of tapioca, salt and pepper.

Method.—Boil the stock, then sprinkle in the tapioca and simmer gently until quite clear. Move the pan to the side of the fire and stir in the well-beaten egg-yolk and cream together. Keep stirring for 3 minutes to cook the egg, but do not let boil or it will curdle.

Cakes.

23. ARROWROOT BISCUITS. Take 2 eggs, ¼ lb. of flour, ¼ lb. of sugar, 3 oz. of butter, and 3 oz. of arrowroot.

Method.—Cream together the butter and sugar. Beat the eggs, yolks and whites separately, and stir them into the mixture. Mix the arrowroot well with the flour and add to the other ingredients, beating well. Roll the dough out thinly, cut into rounds, and bake on floured tins in a slow oven.

24. GINGER BISCUITS. Take ½ lb. of flour, ¼ lb. of sugar, 3 oz. of butter, 2 eggs, and ½ oz of ginger.

Method.—Rub the butter into the flour, add the sugar and ginger. Beat the eggs and add them to the mixture. Roll the dough out thinly, cut into rounds, and bake on floured tins in a quick oven.

Ginger is a useful stimulant for a weak digestion.

25. Oatmeal Biscuits. Take 6 oz. of oatmeal (fine), 5 oz. of flour, 3 oz. of butter, 2 oz. of sugar, 1 egg, 1 teaspoonful of salt, and a very little milk.

Method.—Mix together the dry ingredients, add the beaten egg and enough milk to make a stiff dough. Roll out, cut into shapes, and bake on floured tin in a quick oven.

26. Light Invalid Cakes. Take 2 oz. of butter, 2 eggs, 2 oz. of flour, 1 oz. of cornflour, 3 oz. castor sugar, and 1 teaspoonful of Paisley flour.

Method.—Cream the butter and sugar, beat up well and add the eggs, mix together the three flours and stir in to a smooth batter. Bake in well-buttered patty tins, in a quick oven, to a golden brown.

27. Sponge Cakes. Take 2 oz. of flour, 2 oz. of castor sugar, 2 eggs, and flavouring.

Method.—Beat the eggs and sugar together to a thick cream, sift in the flour lightly, flavour. Put the mixture into prepared tins and bake in a hot oven for about 15 minutes, when the cakes should be firm to the touch. Remove carefully from the tins and dry on a sieve. When cold sprinkle with fine sugar.

To prepare the tins, grease well with butter and sift over equal quantities of sugar and flour mixed.

Egg Dishes.

28. Coddled Eggs. Place a new-laid egg in a cup and pour over it boiling water. Let it stand in a hot place for about 6 minutes. Thus cooked the white has a jelly-like consistency and the whole egg is tasty and wholesome.

This method of cooking eggs is better than boiling for invalids.

29. Egg Snow. Take 1 egg, 1 tablespoonful of milk, 1 tablespoonful of orange juice, and 1 teaspoonful of sugar.

Method.—Beat the yolk of the egg with the sugar and milk; whip the white to a stiff froth; add the orange juice and stir all together.

This is a pleasant way of taking a raw egg.

30. Baked Custard. Take 2 eggs, ½ pint of milk, ½ oz. of castor sugar, and flavouring.

Method.—Beat the eggs well and stir in the milk, sugar, and flavouring. Pour into a buttered pie-dish and bake in a slow oven till set. Do not let boil, and serve either hot or cold.

31. Plain Omelette. Take 2 eggs, ½ oz. of butter, 1 tablespoonful of milk, pepper and salt.

Method.—Break the eggs into a basin and beat them well. Stir in the milk, season to taste, melt the butter in an omelette pan, and when hot pour in the eggs, stirring quickly with a fork. Cook over a quick fire and allow to set. Turn out on to a hot dish and serve at once.

32. Poached Eggs in Milk. Fill a small pan three-quarters full of milk and bring to the boil. Break 2 eggs carefully into a saucer and slide them into the boiling milk. Cook for 5 minutes and take up with a slice and serve on 2 rounds of buttered toast with a little milk on the plate.

This method gives to the eggs a more delicate flavour and is more nourishing than cooking in water.

33. Scrambled Eggs. Take 1 egg, ½ oz. of butter, 1 tablespoonful of milk, some pepper and salt, and 1 slice of hot, buttered toast.

Method.—Lightly beat up the eggs, stir in the milk, add pepper and salt, melt the butter in a small saucepan. Pour in the egg mixture, and stir with a fork until the egg is set. Serve on the hot toast.

Fish Dishes.

34. Baked Cod Cutlets. Place the cutlets on a greased baking tin. Sprinkle lightly with salt, pepper, and a little lemon juice. Cover with buttered paper, and bake in a moderate oven for about ten minutes.

35. Eel Stewed. Wash the eel well in cold water and salt. Cut off the head, tail, and fins, and cut up the eel into small pieces. Put in a pan with enough cold water to cover and blanch to clean and extract some of the fat. Simmer gently in ½ pint of stock for one hour and lift out the eel on to a dish. Thicken and season the gravy and pour it over the eel and serve.

Eel is an oily fish and is specially suitable for a convalescent who is ordered fats.

36. Fish Cream. Take 4 oz. of white fish (whiting, sole or haddock), ½ gill of milk, ½ gill of cream, 1 beaten white of egg, ½ oz. of bread crumbs, ½ oz. of butter, seasoning.

Method.—Melt the butter in a small pan, add the milk and crumbs, and cook until thick. Turn into a mortar, shred the fish finely, add it to the sauce and pound them well together. Add the cream and stiffly whipped white of egg. After seasoning, turn the mixture into a greased mould, cover with

greased paper, and steam gently for 40 minutes. If desired, this dish may be served with a white sauce.

37. SOLE, GRILLED. Trim off the fins of a fresh sole, season with a little pepper and salt, butter it all over, and grill over a nice, clear fire. Serve with white sauce.

38. WHITING, BOILED. Skin and truss the whiting with its tail in its mouth. Put it into a stewpan with just enough hot water to cover it. Add a dessertspoonful of vinegar or a teaspoonful of lemon juice and salt to taste. Cook very gently for 10 minutes keeping the water just below simmering point. Drain well, and serve with parsley or white sauce.

39. WHITING, STEAMED. Take 1 whiting, 1 gill of milk, ½ oz. of butter, ½ oz. of flour, lemon juice, salt and pepper.

Method.—Skin the fish and truss it with its tail in mouth. Sprinkle lightly with salt, pepper, and lemon juice. Put it on a well-buttered soup plate and cover with a buttered paper. Place the plate on a saucepan of boiling water and cover it with the saucepan-lid. Cook for about 30 minutes, turning the fish at half-time. To make the sauce, blend the flour and butter in a small pan, add the milk, stir till boiling and cook for about 5 minutes. Season with salt, pepper, and lemon juice, pour over the whiting and serve.

Sole and whiting are considered to be the most digestible and most nourishing fish for invalids.

Jellies.

40. BEEF JELLY. Take 1 pint of beef tea, 1 oz. of gelatine, some salt and pepper.

Method.—Dissolve the gelatine in 2 tablespoonfuls of hot water and add the beef tea. Season to taste, stir until it begins to set, and then pour into small moulds. Stand until the jelly is firm.

This is a useful food in cases where all nutriment must be given cold or iced.

41. CALF'S FOOT JELLY. Take 2 calves' feet, 5 pints of water, 4 oz. of loaf sugar, ½ gill of lemon juice, 1 gill of sherry, the rind of 1 lemon, whites and shells of 2 eggs, 2 cloves, 1 inch of cinnamon stick.

Method.—Cut the feet into 4 pieces, remove all marrow and fat, and blanch. Put them in the stew pan, add the water, and simmer gently for 6 hours, skimming occasionally. Strain and measure the stock, if necessary boiling to reduce it to not more than 1 quart. Allow to cool, then remove every trace of fat. Replace jellied stock in stewpan and add thinly peeled lemon rind, lemon juice, sherry, sugar, the crushed eggshells, stiffly whisked whites of egg, cinnamon, and the cloves. Whisk while coming to the boil, then simmer gently for 10 minutes. Strain through a scalded jelly bag and turn into moulds, previously rinsed with cold water.

42. CHICKEN JELLY. A whole chicken is not needed for this, a carcase alone being sufficient. If, however, a whole bird is used, remove the breast fillets and put aside. Cut up the bird and remove all flesh from the bones. The neck and gizzard may be used, so well wash. Put the prepared chicken into a saucepan with enough cold water to cover, adding a pinch of salt. Bring to the boil, skimming occasionally, and simmer gently for 3 hours. Strain, allow to cool, and remove all fat from the top.

This stock may be taken either hot or in its jellied state.

43. COW HEEL JELLY. Take 1 cow heel, 3 pints of water, 2 lemons, whites and shells of 2 eggs, 3 wine glassfuls of sherry, sugar to taste.

Method.—Put the heel into a pan, add the water, and simmer gently down to 1 pint. Strain and allow to cool. Remove all fat. Replace the fluid in the pan; add sugar and sliced lemon, the whites and shells of eggs; beat well; add wine; bring to the boil for 1 minute; remove from fire and stand for a few minutes; strain through a jelly bag or very fine muslin into a wetted mould.

44. IRISH MOSS JELLY. Carefully wash ½ oz. of Irish moss and soak it for 12 hours in cold water. Strain and put in a stewpan with 1 pint of water. Simmer gently for 5 hours, making up any evaporation that occurs. Strain, add 1 dessert-spoonful of lemon juice and ½ glass of sherry (optional) and sugar to taste, and turn into a mould previously rinsed with cold water.

Irish moss (carageen) possesses medicinal properties and can be used instead of animal jellies and starches in preparing soups, jellies, and creams; or as a soothing drink for coughs.

45. MILK JELLY. Put ¾ oz. of gelatine in a pan with ½ a pint of milk. Add 1 oz. of sugar and 2 or 3 thin strips of lemon rind. Dissolve the gelatine slowly by stirring over

gentle heat. Strain into a basin and allow to cool, stirring occasionally. Pour into a jelly mould and put in a cool place to set.

Milk with gelatine added becomes more easily digestible.

46. ORANGE JELLY. Take ½ pint of water, ½ pint of orange juice, rind of 3 oranges, 3 oz. of loaf sugar, 1 oz. gelatine.

Method.—Put the water, orange rind, sugar, and gelatine into a pan and stir over gentle heat until dissolved. Cover and allow to soak for 10 minutes. Add the orange juice and strain. Pour into a rinsed mould and leave to set.

47. PORT WINE JELLY. Take 3 gills of port wine, 1 gill of water, 1 tablespoonful of red currant jelly, 1 oz. gelatine, 2 oz. sugar, 1 inch cinnamon stick, rind and juice of 1 lemon.

Method.—Thinly peel the lemon and strain the juice. Put all the ingredients into a pan, stirring over a slow fire until dissolved. Move the pan to one side and let the contents infuse during 15 minutes. Strain through jelly bag and when cool enough pour into wine glasses and leave to set.

48. RESTORATIVE JELLY. Take 1 ox foot, 1 lb. of shin beef, 1 quart of cold water, ½ teaspoonful of salt.

Method.—Cut the beef into small pieces, blanch the foot, divide it into small pieces, and put with the beef into a jar with water and salt. Seal the lid with greased paper and place the jar in a pan of boiling water. Cook slowly for 6 hours. Skim, strain, season, and pour into a wetted mould.

This preparation may equally well be served warm as a soup.

49. STRENGTHENING JELLY. Take 1 pint of port wine, 2 oz. of white wine, 2 oz. of isinglass, a little nutmeg, sugar to taste.

Method.—Put all the ingredients in a jar and cover. Place the jar in a pan of hot water and stir constantly till all is dissolved. Let it cool to a firm jelly, and cut into pieces the size of a small nut for giving to the invalid.

Meat Dishes.

50. CALF'S FEET, STEWED. Take 1 calf's foot, 1 pint of water, ½ gill of cream, 1 oz. of flour, 1 oz. of butter, 1 small onion sliced.

Method.—After washing and blanching the foot, place in the stewpan with the onion and water. Stew gently for 3 hours, making up any undue evaporation. Remove the bones and cut up the meat into small pieces. Place on a dish and keep hot. Melt the butter, stir in the flour, strain the stock, and boil for 5 minutes. Season and stir in the cream. Pour this sauce over the meat and serve.

Calf's foot may also be baked or boiled and makes a nutritious dish for sick persons.

50. INVALID CUTLET, STEAMED. Trim the fat off a lamb or mutton cutlet and place on a well-buttered soup plate. Sprinkle lightly with salt and pepper, cover with another plate, and place on the top of a saucepan of boiling water. Cook for about 45 minutes, turning it once. Serve with its own gravy.

51. FRESH MUTTON, MINCED. Choose 6 oz. of tender, juicy, lean mutton and trim off all the fat. Cut into very small pieces. Melt ½ oz. of butter in a stewpan, and in it fry a small piece of finely-chopped onion. Add the meat and simmer gently for 10 minutes. Stir in 1 teaspoonful of flour and ½ pint of stock. Season and simmer gently for another 10 minutes. Serve on a piece of crisp toast.

52. TRIPE, STEWED. Take ½ lb. of tripe, ½ pint of milk, 1 teaspoonful of flour, 1 onion, pepper, salt.

Method.—Remove all fat and blanch the tripe. Cut into small pieces, chop the onion, and put the tripe, onion, and milk into a saucepan. Season and simmer gently for 2 hours. Mix the flour to a smooth paste with a little cold milk and add to the stew. Boil for 5 minutes, stirring constantly. Serve hot.

Tripe is a favourite invalid dish as it is easily digested and highly nutritious.

53. SWEETBREADS, STEWED. Take 1 sweetbread, ½ pint of milk or white stock, 1 tablespoonful of cream, 1 dessertspoonful of arrowroot, lemon juice, pepper, salt.

Method.—Soak the sweetbread in slightly salty cold water for 1 hour, then blanch it. Lift into a bowl of cold water and pull away any remnants of fat or gristle with the fingers. Tie in a piece of muslin, place in a stewpan, and cover with hot stock or milk. Simmer gently for about 1 hour and when the sweetbread feels tender, lift on to a square of toast. Break the arrowroot to a smooth paste with a little stock and strain it into the stock in the pan. Boil for 5 minutes, season, add the cream, and pour this sauce over the sweetbread, which has not been allowed to cool off.

Poultry.

54. CHICKEN CREAM. (*See* FISH CREAM.) Chicken cream is made in the same way, but

the chicken meat must be passed through a mincing machine before pounding.

55. Chicken Fillets. Take the breast meat of a chicken and place it between two buttered plates. Sprinkle with lemon juice and cook for 30 minutes over a pan of boiling water. Serve with a white sauce.

56. Chicken, Stewed. Take 1 chicken, 1 yolk of egg, ½ pint of water, ½ pint of milk, salt, pepper.

Method.—Boil the water and meanwhile divide up the chicken into small joints. Put into the water, add the milk, and a little salt. Simmer gently for 2 hours. Fifteen minutes before serving make a smooth paste with a dessertspoonful of flour and a little cold milk. Add it to the stewpan, stir until boiling, then simmer for 5 to 7 minutes. Beat up the egg yolk and add to it 3 or 4 tablespoonfuls of the liquor from the stewpan and after mixing well pour it back. Cook for 5 minutes, stirring occasionally. Season and serve.

57. Pigeon. Take 1 pigeon, 3 gills of hot brown stock, 1 teaspoonful arrowroot, ½ oz. butter, pepper and salt.

Method.—Melt and heat the butter to smoking point, then brown the pigeon in it. Pour over it the hot stock and simmer very slowly for 1½ hours. Mix the arrowroot to a smooth paste with a little cold water and add it to the stock. Boil for 5 minutes, stirring occasionally. Season and serve.

58. Rabbit. Take 1 young rabbit, 1 pint of water, ½ pint of milk, 1 oz. of flour, 1 oz. of butter, 1 small onion, 2 cloves, salt and pepper.

Method.—Cut up the rabbit and place in the stewpan with cold water, onion sliced, cloves, and salt and pepper to taste. Bring to the boil, skim, and simmer gently for 1 hour. To make the sauce, mix the flour to a paste with a little cold milk, add the butter, put into a stewpan with ½ pint of the liquor in which the rabbit was cooked, and boil for 5 minutes. Season, pour over the rabbit and serve.

Puddings.

59. Arrowroot Blancmange. Mix to a paste 1 oz. of arrowroot with a little cold milk. Pour on 1 pint of boiling milk, put into pan, flavour and sweeten to taste. Boil for 10 minutes, stirring all the time. Pour into wetted moulds and leave till next day to set. Turn out and serve in the usual way.

60. Arrowroot Soufflé. Take 1 oz. of arrowroot, ½ pint of milk, 2 eggs, ½ oz. of sugar, vanilla, and salt.

Method.—Mix the arrowroot into a smooth paste with a little cold milk. Boil the rest of the milk, pour it over the arrowroot, stirring all the time. Pour it back into the pan, add the sugar, vanilla, and a pinch of salt. Cook and stir for five minutes. Take off the fire beat in separately each egg-yolk, stiffly whisk the whites of eggs, and stir in lightly. Pour into a buttered pie-dish and bake in a moderate oven for 20 minutes.

61. Baked Custard. Take 2 eggs, ½ pint of milk, ½ oz. of castor sugar, lemon or vanilla flavouring.

Method.—Beat the eggs well, stir in the milk, add sugar and flavouring, and pour the mixture into a buttered pie-dish. Bake in a moderate oven for 20 minutes. Serve either hot or cold.

62. Invalid Fruit Tart. Take 1 sponge cake, 1 egg, 1 gill of milk, 1 large apple, 2 tablespoonfuls of water, 1 teaspoonful of castor sugar, 1 dessertspoonful of sugar.

Method.—Boil the water with the dessertspoonful of sugar, add the apple, peeled and sliced. Cook till tender, beat to pulp, and spread at the bottom of a greased pie-dish. Cover with the sponge cake, cut into thin slices. Beat up the egg, stir in the milk, add the castor sugar, and pour it over the sponge cake. Leave to stand for a few minutes, then bake in a moderate oven for 20 minutes.

63. Junket, or Curds and Whey. Take ½ pint of milk, ½ teaspoonful of rennet, 1 teaspoonful of sugar, almond or vanilla flavouring.

Method.—Dissolve the sugar in the milk, warm to body heat, and add the rennet and flavouring. Allow to cool and keep in a cold place if possible. Serve with cream and sugar if desired.

64. Milk Puddings. Take 1 oz. of rice, ¾ pint of milk, 1 egg, 1 oz. of sugar, flavouring.

Method.—Rinse the rice well in cold water, put in a saucepan with the milk, and simmer till the milk is thick. Add the sugar and flavouring and well-beaten egg. Pour this mixture into a buttered pie-dish and bake in a moderate oven for 20 minutes.

Other farinaceous foods which may be used for milk puddings are: sago, cornflour, pearl barley, semolina, etc

65. SEMOLINA CREAM. Take 1 oz. of semolina, 1¼ pints of milk, ½ oz. of gelatine, sugar, and vanilla to taste.

Method.—Put the semolina to soak for 1 hour in ¼ pint of cold milk. Place in a stewpan and add another ½ pint of milk and simmer gently for half an hour. Dissolve the gelatine in the remaining ½ pint of milk by bringing it to the boil and stirring. Mix into the semolina, sweeten and flavour to taste, and stir over moderate heat until the cream thickens. Pour into a wetted mould to set.

Sandwiches

66. ASPARAGUS ROLLS. Roll 1 asparagus tip in a thinly cut piece of buttered bread, having removed the crust.

67. EGG-YOLK. Boil a new-laid egg for 10 minutes, rub the yolk through a sieve, season lightly, and spread between thin pieces of bread and butter.

68. MUTTON. Fresh minced mutton (*see* Recipe 51) allowed to cool and pounded in a mortar makes tasty and pleasing sandwiches.

69. RAW BEEF. Shred the meat finely and spread on thin bread and butter. Season well, put another piece of bread on top, trim into neat squares, and serve. If desired, the bread may be plentifully covered with castor sugar and the salt and pepper omitted. Thus prepared the taste of the meat is entirely masked.

Sundry Invalid Foods.

70. ARROWROOT CUP. Take ½ oz. of arrowroot, ½ pint of milk, ½ teaspoonful of sugar. Mix the arrowroot into a smooth paste with a little cold milk. Heat the rest of the milk and stir it into the arrowroot. Rinse the pan and pour back the mixture, bring to the boil, cook for 5 minutes, stirring all the time. Serve with sugar to taste.

71. BEEF TEA (for Invalids). Take 1 lb. of lean, juicy beef, 1 pint of cold water, ½ teaspoonful of salt. Remove all fat, skin, and gristle from the beef, cut into fine pieces, and soak in a basin with the salt and water for 20 minutes. Warm slowly in a stewpan until the liquid is red and the meat has lost its colour. Pass through a fine sieve and allow to cool. Remove every particle of grease by drawing tissue paper over the surface. Re-heat to serve. Care must be taken that the beef tea does not reach simmering point. If it does, the heat will seal the pores of the meat and keep in the meat juices which it is desired to extract.

72. BEEF TEA (for Convalescents). Take 1 lb. of gravy beef, 1 pint of cold water, ¼ teaspoonful of salt. Prepare the meat as in Recipe 71, place in an earthenware jar with the salt and water, and cover closely. Stand the jar in a saucepan of boiling water or a slow oven and cook for three hours. Strain, remove all fat, and serve.

73. RAW BEEF TEA. Prepare the beef as above, pour on the water, add the salt, cover and stand for 2½ hours. Strain and serve.

For this recipe 2 oz. of raw beef and 2 tablespoonfuls of water are sufficient. The preparation is given during teething, and in dysentery and typhoid fever. It should only be given on doctor's orders. The protein, being uncooked, is easily digested.

74. BEEF-TEA CUSTARD. Whip up a new-laid egg, pour on one teacupful of beef-tea, turn into a buttered basin, and cover with greased paper. Steam gently for 20 minutes and serve.

75. BREAD AND MILK. Crumble some bread and steep it for 15 minutes in boiling water in a covered cup. Drain off the water, fill the cup up with warm milk, and beat well. Place in a pan, boil gently for 2 minutes, stir, and serve with sugar and more milk, if desired.

76. EGG FLIP. Mix 1 tablespoonful of brandy, or sherry, and ¼ pint of milk. Beat up the white of an egg to a stiff froth and stir into the milk. If desired, a little castor sugar may be added to the milk before adding the egg.

77. EGG AND BRANDY. Take 2 oz. of brandy, the yolk of one egg, ½ oz. of loaf sugar. Whip up together the egg and sugar, add the brandy, and stir. This is an exceedingly powerful restorative.

78. EGG NOG, HOT. Take the yolk of 1 egg, 1 pint of milk, 1 tablespoonful of brandy or whisky, 1 tablespoonful of sugar. Whip together the yolk of egg and sugar and stir in the spirits. Boil the milk and add to the other ingredients, stirring well.

79. GRUEL. Take 1 oz. of medium oatmeal, ½ pint of cold water. Mix the oatmeal and water to a paste, cover, and leave to soak for 1 hour. Stir up and strain into a pan, bring to the boil, still stirring, and simmer for 15 minutes. Serve with sugar or salt to taste.

80. PORRIDGE. Allow 1 tablespoonful of oatmeal to ½ pint of water. Soak the meal

in the water overnight and half an hour before required, bring slowly to the boil. Add a generous pinch of salt, reduce heat, and allow to simmer *very* gently. Stir from time to time to prevent lumps forming. Made thus, porridge is more easily digested.

81. Port Wine Lozenges. Take 1 gill of port, ¼ oz. of isinglass, 1 teaspoonful red-currant jelly, 4 lumps of sugar, 1 inch of cinnamon stick. Stir together all the ingredients over the fire until dissolved. Cover and let soak for 10 minutes. Strain and pour into a flat tin. When cold cut into small squares.

82. Sponge Fingers. Dip some sponge fingers in champagne and cold milk (equal parts). Serve at once.

83. Posset, Treacle. Take 2 tablespoonfuls of treacle, ½ pint of milk, juice of half a lemon. Boil the milk, pour in the treacle and lemon juice, and strain when the milk curdles. Give as a remedy for colds.

Foods for Special Conditions

Diabetes.—A diabetic patient largely loses the power to digest starchy foods. All excess of carbohydrate turns to sugar in the blood, is collected by the kidneys, passed out in the urine, and the patient loses weight and stamina.

To counteract this, as well as to avoid the formation of sugar, the diet must be rich in proteid foods and contain only as much starch as the patient can digest.

To supply warmth and energy, fats must largely take the place of carbohydrate. Therefore eggs and creams may be generously given, as they are rich in protein and fats, but are void of carbohydrate.

Sugar-free milk is now obtainable, and also certain starch-free farinaceous foods, which will aid the digestion and please the palate of the diabetic patient. Some diabetic recipes follow.

84. Almond Sponge. Take 1 oz. of almond flour, 2 whites of egg, saccharine and salt. Whip the whites of egg stiffly, beat in the flour lightly, add a pinch of salt and saccharine to taste. Bake in a hot oven for 20 minutes. To make a good bread substitute, omit the saccharine.

85. Coconut Cakes. Take 2 oz. of unsweetened coconut, 1 egg, 2 oz. of almond flour, 1 oz. of butter, milk, saccharine and salt. Cream the butter, beat in the flour, add coconut, a pinch of salt, and saccharine to taste. Stir in the egg and add enough milk to form a stiff batter. Make small heaps on a greased tin and bake in a hot oven for about 20 minutes.

86. Diabetic Bread. Take 4 oz. of almond meal, 2 tablespoonfuls of gluten meal, 2 eggs, 1 oz. of butter, 2 teaspoonfuls of baking powder, salt. Mix together the dry ingredients, flake in the butter with the fingers, and add the eggs, one at a time, beating each well. Bake in a shallow tin for 20 minutes.

87. Fish. When cooking fish for diabetic patients, use breadcrumbs from diabetic bread and white of egg to coat the fish.

88. Sauces. Take 2 oz. of butter, 1½ oz. of gluten flour, 1 pint of stock or water. Melt the butter in a pan, stir in the gluten flour, mixing well. Gradually add the stock or water, boil for 5 minutes, stirring constantly, season and serve. If a sweet sauce is required, add saccharine instead of salt and pepper.

89. Soufflés. Take 2 oz. of almond flour, or gluten flour, 2 eggs, ½ pint of milk, flavouring, saccharine. Make the flour into a smooth paste with a little cold milk. Boil the rest of the milk and stir in the flour. Cook until thick, stirring constantly, add saccharine and flavouring to taste, lift off the fire, and beat in the yolks of egg. Lightly stir in the stiffly whisked whites, pour into a buttered pie-dish, and bake in a hot oven for about 20 minutes.

90. Soups. These should not be made from root vegetables or starchy substances. Cabbage, lettuce or spinach are permitted; as are meat, game, poultry, and fish.

Peptonized Foods.—When food is swallowed the digestive juices mingle with it. The proteid elements are thus changed into simpler bodies called "peptones" in order to prepare them for absorption into the system.

Invalids and persons whose digestion is weak may be ordered "peptonized" food, that is to say food that is partly pre-digested. Such preparations must be cautiously given and only on doctor's orders.

To peptonize a food some liquor pancreaticus and bicarbonate of soda are required. Liquor pancreaticus is an extract from an important digestive gland of the cow, and can be bought at the chemist's. The amount used will depend upon the degree of peptonization. The average quantity is one tablespoonful of liquor pancreaticus and one

saltspoonful of bicarbonate of soda for one pint of liquid food.

Peptonization imparts to the food a slightly bitter taste, which becomes pronounced if carried too far. The process may be stopped by bringing the food quickly to the boil as soon as the desired degree of peptonization is reached. The following recipes will explain the method.

91. PEPTONIZED BEEF TEA. Take ½ lb. finely shredded lean beef, 2 teaspoonfuls of liquor pancreaticus, ½ pint of water, 20 grains of bicarbonate of soda, a pinch of salt. Place the beef, soda bicarbonate, and water in a pan and slowly heat to 140° F. while stirring gently. Keep at this heat for half an hour, allow to cool a little, add the liquor pancreaticus, cover, and stand in a warm place for 1 hour. Strain, bring to the boil, season, and serve.

92. PEPTONIZED GRUEL. Take ½ pint of thick gruel, ½ pint of fresh milk, 2 teaspoonfuls of liquor pancreaticus, 20 grains of bicarbonate of soda. The gruel may be made of arrowroot, oatmeal, or any farinaceous food. Add the cold milk to it and stir in the liquor pancreaticus and bicarbonate of soda, while the gruel is still warm. Cover and keep at the same temperature for about half an hour. As soon as the flavour becomes bitter, bring to the boil, sweeten, flavour, and serve.

93. PEPTONIZED MILK. Put 1 pint of milk and ½ pint of water in a pan and heat to 140° F. Pour it on to 2 dessertspoonfuls of liquor pancreaticus and 40 grains of bicarbonate of soda. Cover and keep in a warm place for an hour. Boil up to stop the peptonization. Peptonized milk can be used as an ingredient for various dishes, or may be taken as ordinary milk, hot or cold.

94. PEPTONIZED SOUPS. The stock forming the basis of any soup may be peptonized if desired. Add 1 tablespoonful of liquor pancreaticus and 20 grains of bicarbonate of soda to each pint. Boil up the soup as soon as the right degree of peptonization is reached to stop the fermentation.

Preparations of Cod-Liver.

Some invalids are unable to take cod-liver oil, though ordered it. For them the following recipes may be useful.

95. COD-LIVER SAUCE. Boil ½ lb. of cod-liver, cut into small pieces, add 2 oz. of melted butter, and a little anchovy sauce. This may be served with potatoes or fish.

In the same way cod-liver may be disguised by the addition of pepper, butter, vinegar, or anchovies. The amount can be gradually increased as the patient becomes accustomed to it.

96. COD-LIVER KETCHUP. Add 2 drachms of tomato ketchup to each oz. of cod-liver oil. Shake well before taking.

97. POTATOES AND COD-LIVER. Take ½ lb. of fresh cod-liver and 1 lb. of flowery potatoes peeled and steamed. Cut up the liver, place it over the potatoes, and steam again so that the oil from the liver drips on to them. Add some anchovy sauce to the liver. The potatoes, seasoned with pepper and salt, may be taken alone or with the liver.

98. RICE and COD-LIVER. Boil ½ lb. of rice in 2 quarts of water. Pour off three-quarters of the water and place over the rice 1 lb. of cod-liver cut in cubes. Cook in a slow oven for about 30 minutes, remove liver and serve with anchovy sauce. Stir rice with a fork and serve with salt and pepper. If cooked over a slow fire, take care not to burn.

Liver.

This food is now often used in cases of anæmia and may be prepared in a variety of ways. Sometimes it has to be taken raw.

99. STEAMED LIVER. Take 1 lb. of calf's liver and wash well. Cut into small pieces and steam between two soup plates over a pan of boiling water. When tender, season, and serve on toast.

100. LIVER SOUP. Take ½ lb. of calf's liver, 4 breakfast cups of water, 1 tablespoonful of flour, 1 oz. of butter, 1 onion, 1 carrot, pepper, salt, and a little ketchup. Soak the liver 10 minutes, and cut in two. Chop the onion, cut up the carrot in small cubes, dry one half of the liver and cut up fine. Roll in the flour, already seasoned, and fry in hot butter, with onion and carrot. Add water and other half of liver, bring to the boil and simmer for 2 hours, skimming occasionally. Lift out the piece of liver, grate it, and return to the soup. Add ketchup seasoning to taste, and serve.

Digestive Disorders.

HYPERACIDITY is an excess of acid in the stomach. The condition is not a disease, but a symptom of one of a number of maladies. It may be merely "nervous," or it may be due to an internal ulcer, or diseased organ. If the cause is "nerves," then anything which calms them will help to reduce the

acidity. But if the cause is organic, the cure is not so simple. Evidently the diet should contain a minimum of acids and salts (sodium chloride, a source of hydrochlorid acid.) All strongly spiced food, such as curries and "delicatessen," should be excluded. There may be included in the diet cream and meatless thick soups, boiled white fish, such as cod or halibut, vegetables (excluding cabbage, cauliflower, and onions); toast and dry bread; fresh butter; weak tea and coffee; cereals; lightly cooked eggs (not fried). Meat is best omitted, likewise alcohol. Stewed fruit may be taken, and a pinch of bicarbonate of soda from time to time.

Hypo-acidity is the reverse of hyperacidity. Suitable diet consists largely of the foods forbidden in the former condition. Acid fruits and moderate amounts of stimulants and condiments are indicated, but only the smallest quantities of fat should be taken, for fat digests slowly and delays the passage of the food out of the stomach.

Ulcer of the Stomach. The dietetic treatment of this condition consists of small quantities of protein-rich food. The protein tends to neutralize the acid and thus assists healing. Suitable foods are milk, softly boiled eggs, cream soups, vegetable purees, and custards.

Diarrhœa is rather a symptom than a disease and treatment of the disease will automatically correct the diarrhœa, Sometimes, however, it is caused by eating some unsuitable food or catching a chill. A purgative at the very beginning will often dislodge the irritant and effect a cure. If due to a chill on the stomach, take only a cup of hot arrowroot three times a day.

In chronic diarrhœa, clear soups, white fish, chicken, lamb, soft eggs, rice, macaroni, cereals (not oatmeal), cream and tea may be taken. The following should be avoided: Green vegetables, sweets, fats (except a little butter), fresh milk, fruits, salads, spiced meat, and cold drinks.

Jaundice also is not a disease, but a symptom of a deranged liver or gall-bladder. Dietetic treatment consists of the suppression of fats. Skim milk and farinaceous foods (i.e. of meal or flour) are given. They should be thoroughly chewed before swallowing.

Diet in Common Diseases.

Fevers. Generally speaking, a fever-stricken patient has no desire for food. When the temperature has come down and appetite returned, some liquid nourishment, such as milk or beef-juice, may be given. Later semi-solids, gruels, junket, and jellies precede the return to solid food. This should be easily digestible and laxative, such as toast, chicken, boiled or steamed white fish (whiting, cod, or halibut).

Tuberculosis. In few diseases is diet of such paramount importance as in tuberculosis. Plenty of milk, eggs, butter and cream should be given to fatten up the patient, who is invariably emaciated to begin with. This increase of body weight is almost essential to a recovery from this insidious disease. The scarred lungs heal by the formation of fibrous tissue, which consists largely of calcium. Some authorities, therefore, include fresh lettuce in the dietary in large quantities, since lettuce is rich in this mineral. If the appetite is fickle, the patient should rest flat on the bed for one hour before and one hour after the meal. The rest before eating prepares the organs to receive the food; the rest after eating enables them to digest it.

Diabetes is a disease in which the ability to digest starches and sugars is lost. Carbohydrates are, therefore, largely excluded from the diet. As this deprives the patient of the principal source of heat and energy, ample fats are given instead.

Foods recommended are: Soups rich in fats, fat fish, sardines, ham fat, minced pork, roasted, grilled, or boiled meat, eggs, shellfish (except oysters), green vegetables well-cooked, ripe cheese, nuts, almonds, gooseberries, pears, apples, and oranges.

Drinks permitted are: Water, wine, tea, coffee.

The following are contra-indicated: Ordinary bread, macaroni, pea soup, milk soup, liver, beetroot, asparagus, tomatoes, carrots, turnips, all fruits not mentioned above, pastry, puddings, sweets, sparkling wines, cider, beer, liqueurs.

Gluten bread is a specially prepared, practically starch-free, bread intended for diabetics. It may be included in the diet.

Gout, like diabetes, is the result of failure to digest certain elements and, like diabetes, calls for a revised diet. Here uric acid is the trouble and the new diet must therefore exclude food which produces this substance. This means going without meat and fish,

and a general reduction of the total amount of food eaten. For example:

Breakfast. Apple or banana, some cereal breakfast food, 1 egg, a glass of milk, and 1 slice of white bread and butter.

Lunch. Rice and cream, cheese, 1 slice of bread and butter, stewed or fresh fruit.

Dinner. Baked potato or macaroni, with butter; glass of milk; 1 egg; lettuce or young cabbage; French beans; 1 slice of bread and butter; baked apple or fresh fruit.

(No lavish portions and no second helpings.)

BRIGHT'S DISEASE. This is a failure by the kidneys to perform their task. Treatment therefore aims at relieving the kidneys of all unnecessary work. Meat is excluded, the diet consisting as far as possible of milk, thin gruels, and barley water. Salt must be strictly limited and the intake of fluids kept low. When the urine no longer contains albumen, bread, rice, and potatoes may be given, but meat must still be omitted.

In chronic nephritis the diet is based on the patient's excretory ability and other factors, such as his weight, blood-pressure, and the work required of him.

ARTERIO-SCLEROSIS or hardening of the arteries arises from old age and from an excess of good food and drink. Dietetic measures are the same as in gout, protein being kept down, also milk. Fruit, vegetables and fat are taken instead.

ECZEMA is a skin disease which, in its non-contagious form, may result from too much, too little, or improper food. Or it may be due to a personal sensibility to certain proteins. Dietetic treatment assumes that surplus nitrogenous food, remaining in the system, causes the condition. Therefore a low protein diet is given. Milk, bread, butter, cereals and fresh vegetables are chiefly eaten. Meat is excluded, and fruit, unless stewed, is better avoided.

ANÆMIA is poorness of the blood. As iron builds up the blood, a diet of foods rich in iron will assist the condition. Such foods are yolk of egg, beans, lean beef, nuts, prunes, and spinach. But there is one article of food which surpasses all others for building up the blood: it is fresh liver, and it should be taken daily in sufficient quantity by anyone suffering from anæmia.

LIVER COMPLAINTS. For persons with sluggish livers the following foods are recommended.

Eggs in *moderation* only, grilled or roasted meat, boiled white fish, boiled vegetables (especially carrots), cooked fruit, whipped cream.

The following should be avoided:

Greasy food, spices, oily fish, shell fish, tomatoes, cooked cheese, nuts, pastry in excess, alcohol.

CONSTIPATION. In this condition the following foods may be taken:

Coffee with milk, bread and butter, honey, gingerbread, thin broth, strained vegetable soup, light fish, white meat roasted, fresh eggs, green vegetables, milk foods, fresh cheese, cooked or very ripe fruit.

The following should be avoided:

Chocolate, cocoa, rice, tea, spices, shell fish, smoked or salt meat, high cheese, red wine, liqueurs.

DYSPEPSIA. For this condition the following foods are recommended:

Coffee and milk, milk drinks and soups; grilled, roasted, or stewed meat; light fish (whiting, sole, cod); eggs; green vegetables; thick soups of tapioca, semolina, etc.; light milk and egg puddings, white cheese, cooked fruit; a little crisp toast.

The following should be avoided:

Spices, fat or gamey meats, fat fish (salmon, herrings, sardines, halibut, mackerel), sauces, fried food, salads, dried fruit, strong cheese, pastry, confectionery, ices, neat wine, and liqueurs.

These drinks are allowed:

Half and half white wine, or beer, and water.

GENERAL KIDNEY WEAKNESS. The following may be taken:

Milk, non-fatty soups, grilled meat, cooked fruit and vegetables, milk foods, fresh cheese, ripe non-acid fruits.

These should be avoided:

Sea fish, shell fish, cabbage, cauliflower, asparagus, salads, game; pork, sweetbreads, liver, kidney, pickles, potted meat, spiced sauces, wine, coffee, tea, alcohol.

SKIN DISEASES, IMPETIGO, NETTLE RASH. The following are recommended:

Milk foods, non-fatty soups, grilled or roasted meat without sauce or gravy, boiled river fish, green vegetables, fruit, and white cheese.

The following should be avoided:

Fat, sea fish, shell fish, truffles, caviare, mushrooms, cucumbers, cabbage, strong

cheese, pastry, strawberries, raspberries, dried fruit, bread, salt in excess, coffee, tea, wine.

BEVERAGES.

Generally speaking these are either stimulating, thirst-quenching, nutritive, or combine two or all of these qualities.

Stimulating Beverages include tea, coffee, and spirits. They act upon the nervous system through the caffeine or alcohol present in them. Taken in moderate quantities, at suitable times, they are beneficial, but in excess are harmful. *Tea* is widely drunk in England, China, and a few other countries. There are three chief varieties—China, Indian, and Ceylon.

To make tea the pot should be warmed, a teaspoonful of leaves for each person put into the pot, and *freshly boiled* water poured over them. Three minutes infusion is enough for Indian or Ceylon tea, but five minutes should be allowed for China. To avoid "stewing," that is the drawing off of harmful substances from the leaves, the liquor may be poured off through a strainer into a second hot tea-pot after infusion. Coffee is a powerful stimulant, but has little nutritive value unless sugar and milk or cream are added. Allow one ounce of freshly-ground coffee for each pint of water, place it in a dry, warm coffee-pot and pour on the required amount of freshly boiling water. Let it infuse for 5–8 minutes, keeping the pot closely lidded. When infusion is complete, stir and strain into another warm pot. Many mechanical percolators exist; the drawback to their use is the risk of over-infusion, which makes the coffee bitter.

Coffee extracts are very convenient, as the beverage can be made by the mere addition of boiling water, but they never have the full aroma of freshly-ground coffee. Black coffee should not be taken by those with weak digestions and coffee may be forbidden in certain heart cases. For such there is a special preparation, which is essentially a pure coffee with the caffeine eliminated. It may be taken without any harmful effects.

The principal *spirits* are whisky, brandy, gin, rum. Of these brandy is probably the most useful and is used in cases of extreme debility and exhaustion. All spirits give a feeling of warmth. This is not due to any heat they bring to the body, but to their action of opening the minute vessels (arterioles) and thus allowing a freer circulation of the blood.

Thirst-Quenchers are man's natural beverage—water—with something added to make the drink more tasty.

Lemonade. Squeeze the juice of two lemons. Add a little thinly peeled rind and sugar to taste. Pour over one pint of boiling water and allow to stand until cold. Strain and serve.

Fruit Juices are pleasant and healthful beverages containing vitamins and the natural fruit acids and salts. Many excellent bottled squashes are available and in the better known brands the vitamin content is still intact. The liquor from stewed or canned fruits may be used with aerated or plain water. The addition of ice cream to fruit drinks not only cools them but makes the beverage more interesting and slightly nutritious.

Barley water is an excellent thirst quencher and diuretic. Wash and blanch 1 oz. of pearl barley; then put the grains into a pan with a pint of water and a piece of thinly peeled lemon rind. Simmer slowly for 2 hours. Strain, add sugar to taste, and serve.

Nutritive Beverages.

Cocoa and Chocolate. Prepared cocoa consists of finely ground cocoa beans from which part of the fat content has been removed. Chocolate is cocoa with sugar added and mixed with vanilla, cinnamon, or other spices.

To prepare cocoa or chocolate, put one or two teaspoonfuls of powder into a large cup with enough water to make a fine paste. Gradually add milk to the required quantity and bring gently to the boil, stirring constantly. This method brings out the flavour and gives a smooth beverage with little sediment. Cocoa and chocolate are very suitable for children, as they have a notable tissue-building value.

Milk may be taken hot or cold and should never be gulped, but always sipped.

For those who cannot take milk in its natural form, it may be "peptonized." Particulars are given under INVALID COOKERY.

Beverages Both Nutritive and Stimulating.

Under this heading fall stouts, beers, wines, café au lait, and such "laced" drinks as egg noggs, brandy flips, etc. An account of these is given under INVALID COOKERY.

ATHLETICS AND REMEDIAL EXERCISES

ATHLETICS properly carried out are conducive to the maintenance of good health in the healthy youth, by securing regular and active exercise of all parts of the body, and also by the restraints that the necessary training for athletics imposes on the appetites of the body. The sheer enjoyment which athletics bring in their train help to keep the mind healthy and happy, and a healthy and contented mind is a great asset towards perfect health. The first qualification for the athlete is an organically sound body. If there is any organic weakness or actual disease, athletics as such must be barred and exercise must be suited to the capabilities of the individual concerned. Given, however, a sound body, the average young person can "play" hard with impunity until 25 to 30 years of age if care is taken to suit his exercise to his physical capacity.

The most familiar disorders to which athletes are prone are: staleness, faintness after hard exertion, "strained heart," albuminuria and accidents such as rupture of tendons and muscles. Staleness or "lack of pep," muscular fatigue, and stiffness indicate the need of a period of rest in order to recover tone. Palpitations and breathlessness, faintness, indicate that the heart is being overworked, and abstention from athletics is then indicated for a time. If a good recovery takes place a gradual return to active exercise may be made but the individual must remain under supervision. In many cases, however, the individual must retire for ever from the list of active competitors in athletics, if he would avoid a flabby middle age.

Albumin in the urine after strenuous exertion has no significance unless it persists, when tests must be made to determine whether the kidneys are functioning properly.

Ruptures and strains of muscles and ligaments may recover after a short period of rest and treatment or they may leave a permanent weakness. A good deal depends upon the very early treatment, and it should be impressed upon athletes that injured joints and muscles should not be rubbed and massaged by any inexperienced person on the field. Rest is required first and massage has its place in the treatment later. Cases of concussion should never be allowed to "carry on." They should be made to lie up at once lest the condition is more serious than appears at first.

The outbreaks of boils and septic sores, ringworm and itch that sometimes occur in clubs may be prevented by more scrupulous cleanliness in regard to lockers and changing rooms, and the washing of the athlete's clothing after each wearing. A form of itch on the feet known as "athlete's foot" is very prevalent in America and will doubtless make its appearance here with the increased use of the public swimming baths.

To sum up: athletics undertaken in a common-sense fashion are of great benefit to health and afford a great deal of pleasure. Very young athletes who show great promise should not be encouraged to harm themselves by too strenuous training and competition, but should go slowly until their strength is matured in the late teens and early twenties. A good athlete who has taken care of himself should be able to last at championship standard until he is thirty years of age. Lord Burghley, whose athletic prowess is so well known, left school in 1923, without having attracted attention as an athlete.

Athletics for Women.—The question of women's athletics is so much in the air nowadays that it seems desirable to say a few special words about women, as distinguished from men, athletes. Since the Great War, women have made great strides forward in athletics, until a class of enthusiasts is arising who would like to see women compete on equal terms in events with men. Fortunately the women athletes themselves recognize the absurdity of this and are content to excel amongst themselves. The anatomical and physiological differences between the sexes account for their difference in athletic capacity. The woman has shorter and less muscular legs. She has more fatty tissue, fewer corpuscles in her blood and a smaller heart and lungs. She is less able therefore, to perform feats of arduous muscular work, and attain great speed in

running events. On the other hand she can endure physical hardship for a longer duration than men, and can therefore excel in long-distance swimming events, and, though they are not properly speaking athletics, her endurance on long-distance flights may be mentioned.

The real importance of the subject, however, lies not in whether women are to play football in mixed teams, etc., but in what will be the effect on future generations of athleticism in the women who are to be the mothers of those generations. It cannot be denied that the introduction of moderate outdoor exercise for women in their school years and afterwards has been of great benefit to the race as a whole, by increasing the physical fitness of women. But most gynæcologists agree that the woman who has over-developed her muscles has a harder time at her confinements than her softer sister, and neurologists assert that competitive athletics have a more deleterious effect on the female nervous system than on the male. This latter assertion seems to require more proof than is at present put forth, and no girl, who has common sense enough to know when to draw the line need fear that by being the champion of her tennis club she is going to harm her future children. When it comes to the very few who compete in world championships, they are exceptional women to begin with, and can be left to look after their own interests. It is not likely that women having once felt the joys of exercise in the open air will return to their sedentary indoor leisure-hour pursuits.

Athletic Training.—The first essential for the athlete is to have a thoroughly healthy body, but given the healthy body it is also necessary not only to keep it in health, but to educate it to meet with safety the exceptional demands that will be put upon it by whatever form of athletics it is desired to excel in. This special preparation is called training. There are many pitfalls to be avoided in training. It is just as essential not to be over-trained as it is not to be undertrained. The happy medium must be struck and the training must be adapted specially to the sport for which the individual is preparing, for instance great development of the arms is not required of the long-distance runner and the upkeep of these muscles is at the expense of the total muscular reserve of the body, though to neglect them would be unwise.

In the olden days training was carried to lengths that are now recognized to be unnecessary and harmful. No one nowadays dreams of ordering a course of emetics, purgatives, sweating mixtures and bleedings for the candidate for athletic honours, nor are all the natural and normal pleasures of life forbidden to the man in training. A certain amount of deprivation and self-denial there must be, but not more than the ordinary young man or woman will feel well worth while, for there is no more glorious sensation than that of being absolutely physically fit, and completely master of one's body and muscles. The duration of training must differ according to individual idiosyncrasies. For a person who has trained before or is in generally good condition the usual period allowed is two months, but longer may be necessary. No rule can be laid down, however, and it is important that every schedule should be drawn up with reference to the requirements of the individual athlete.

The object of training is to bring the body which is fitted to perform all the tasks of everyday life into such a condition of extra strength, that it will be able to safely perform feats of physical endurance and violent exercise. Heart, lungs, muscles and nerves, therefore, need a special course of training through prolonged exercise, to bring them to such a condition that they can fulfil the demands that will be put upon them. The first essential is to secure a good "wind." Muscular activity produces substances in the blood, of which the chief is lactic acid, which lead to fatigue and exhaustion, if not burnt up by oxygen. An increased supply of oxygen therefore must be obtained in the blood of the athlete by development of the heart and lungs. The oxygen in the blood must not be used wastefully on activities that have nothing to do with the immediate end in view, so the second requirement of good training must be to acquire proper co-ordination of the various systems of the body, and the fullest use of the muscles which are brought into play. For this reason training must deal with questions of body balance, posture, use of the arms in running, and style in general. Given good wind and well co-ordinated muscles the factor which will really tell most strongly

in the hour of contest is the state of the nervous system, and this also requires as careful attention as the physical development.

Diet in Training.—This is a subject which has given rise to much controversy. Some foods are said to be good or bad for the wind. It is supposed by some people that energy, stamina and endurance are directly obtainable from selected and concentrated foodstuffs. The liquid fallacy must also be mentioned—the theory that as little liquid must be taken as is consistent with the maintenance of life. The truth of the matter is that food which is the source of energy is good for the athlete, and that other food is bad. The athlete needs all the varieties of food substances that are necessary to other persons namely, proteins, carbohydrates, fats, salts and water. For athletic fitness slightly more vitamins and a larger proportion of proteins are needed. For this reason a vegetarian diet is not sufficient. Of the carbohydrates the very best for training is sugar. Fats are good sources of energy but are not so quickly converted into energy. The fact that athletes in training often develop a craving for butter shows that they unconsciously recognize their need for fats. The ideal diet for training will be one in which there are plenty of proteins, sugar and green vegetables, and a certain amount of fat and liquids. It must not be forgotten that although nature demands a certain amount of undigested residue or roughage to keep the intestines healthy, the athlete will be hindered by a clogged bowel and abdominal distension, therefore his food should be in an easily digested form. For the same reason fluids at meals should be avoided, though an adequate amount should be taken between meals.

No rules can be laid down for the amount of food taken in training, as no two men are the same in their requirements, and what is necessary for one man would be a glut to another. The appetite is the safest guide. The meal should just satisfy hunger, and last without causing undue pangs of hunger to the next meal.

The following is a good average routine for the man in training:

On Waking.—Sip a glass of cold water.

Breakfast.—Porridge or cereals if accustomed to them, with milk, cream and sugar, if liked. Fresh fish, eggs or bacon Toast or dried bread, butter, marmalade or jam Only one cup of tea. Any fresh fruit, but not the tinned varieties: these lack vitamins.

At midday, unless in the midst of exercise, a large drink of water or barley water may be taken.

Lunch, which should be a couple of hours before strenuous exercise. Cold meats, salad, toast or bread. A small glass of water or ale. If there is to be no exercise in the afternoon a larger meal may be taken.

Tea.—A cup of tea. If after exercise, a couple of slices of bread and butter. Each cup of tea should contain two or three lumps of sugar.

Dinner.—Half an hour before dinner a large glass of water should be taken and at dinner there should be no soups. The usual courses of joints and sweets may be taken. Green vegetables and potatoes, boiled onions, carrots and celery may all be taken. The best sweets are stewed fruit, milk puddings and cream. A glass of beer may be taken if accustomed to, and fresh fruit, figs, almonds or raisins.

Alcohol is not necessary in training, and no spirits should ever be taken. If the individual is accustomed to it, a small glass of beer may be taken with lunch and dinner. An occasional half-bottle of champagne is allowed when it seems necessary to raise the spirits of a team in training. It must not be forgotten, however, that exercise uses up the fluids in the body and the athlete therefore requires more fluid intake, in the form of water, than the ordinary individual.

With regard to sleep, eight or nine hours regular sleep is sufficient, and an hour's rest in the recumbent position may be taken in the early afternoon if desired. The morning bath should continue at the temperature to which the individual is accustomed, whether hot, warm, or cold, but a warm bath is needed after violent exercise to cleanse the skin. No tonics or drugs should be taken during training unless there is a special indication for their use.

Tobacco, even in small amounts, has a quite definite effect on the rate of the heart's beat, therefore it is prejudicial to the athlete, but if a confirmed smoker tries to give up the habit entirely, he may suffer from ill-effects, such as insomnia, restlessness, etc. He must therefore decide for himself to what extent he can knock off tobacco. The young athlete

would be well advised never to begin smoking. If he does not begin it he will not miss it and his heart will benefit accordingly.

Exercise.—An unchangeable law of Nature decrees that disuse breeds loss of the power to use. This is amply illustrated by the practice of a certain sect of Indian mendicant priests, who renounce, in the name of religion, the use of one of their arms. These men hold the chosen limb continually in a fixed position, usually straight above the head. In a few months the muscles degenerate, the joint stiffens, and it is no longer possible to move that arm even should its owner wish to do so.

Primitive man was obliged to hunt and kill his quarry in order to feed himself. Later on with crude implements he laboriously cleared the forest, tilled the soil, sowed and harvested his crops. In both these forms of existence he was constantly exercising muscles all over his body.

The same is true to-day of the mentally backward people of the globe. The Fijian native, for example, expends much labour in fishing and hunting, providing clothing and shelter, scooping out canoes from tree-trunks with simple tools, and gathering fruits and nuts. The drawing of water from the well, the husking of the rice, and the preparation of soft and beautiful cloths from bark and vegetable fibres by the women, all involve muscular work on a vastly different plane from that of the western housewife or seamstress.

For as civilization has advanced, western nations have designed and employed machinery to avoid just such muscular effort, and in consequence man's normal occupation has become more and more sedentary. The result is that many people need definite exercise, apart from their ordinary work, in order that their bodies shall function properly, that is to say, that they shall retain the use of all their muscles.

Effects of Exercise.—The effect of exercise is two-fold, local and general. The local effect is an increased flow of blood to the working muscles, because both the arteries and veins within the muscles dilate in exercise. This nourishes the muscles and assists "metabolism," or the perpetual process which is going on in the body, of replacing outworn tissues by new cells. Furthermore, by continued and regular exercise the muscles are developed and mobility of the joints is increased.

The general effect of exercise is a greater need for oxygen and hence deeper breathing. This deeper breathing forces the organs of respiration to work more energetically, increases the mobility of the ribs, and develops and strengthens the breathing apparatus. The heart responds also and the circulation of blood throughout the body is improved both by the heart's stronger contractions and by the pumping action upon the local veins by the muscles which are in work. Every voluntary movement requires a complicated exercise of the brain and nervous system, and these organs are thereby exercised and developed and receive an increased supply of blood and nutrition. This general increase in efficiency in the working of the body demands a general increase of nutrition. Thus, in an indirect way the digestive organs and organs of excretion are stimulated to a greater activity and a feeling of well-being follows from this general toning up of the whole system.

In adults, lack of adequate exercise is shown by comparatively poor chest expansion, sluggish action of the digestive organs, flabbiness of the muscles, including the muscles of the heart, and probably imperfect removal of waste products by the excretory apparatus. In time the health must suffer and then the desire and capacity for taking exercise will be lessened. Thus a sort of vicious circle is established which can only be broken by a determined and systematic routine of exercise.

Meanwhile, these unhealthy physical conditions affect the mental faculties. Worry, depression, and imaginary fears begin to obtrude, judgment becomes less sure, and decisions more difficult to take.

All this has been recognized not only by those in authority in the Army, Navy, Air Force, Police, and Schools, where systematic exercise is compulsory, but also by the medical profession, who now prescribe graduated and remedial exercises for the treatment of certain complaints. Prevention, however, is better and easier than cure, and one great merit of regular exercise is the comparative freedom from minor ailments which it confers upon its devotees. But in addition to this it increases the stamina and the power of resistance to serious disease. It helps to

banish worry, and imparts a sense of well-being and enjoyment of life, so that the problems of life are tackled in that spirit of cheerful optimism which is more than half the battle, and helps a lot towards success. This improvement has another result. It wards off old age and proves that there is no real need to deteriorate physically as soon as thirty or forty years are reached. The ancients knew this well. The pick of Alexander the Great's army were over sixty, Julius Cæsar at the age of forty-one was referred to as "a very young man," and those hardy people, the Spartans, did not marry until they were thirty.

The value of exercise to the race is now widely understood on the Continent and physical-culture lessons are broadcast on the wireless early every morning in Germany, Italy and France.

It is clear, therefore, that if the adult body is to function properly a certain degree of physical exercise is needed, and for the healthy growth and development of children it is absolutely essential. Nature has implanted in all young things this instinct to exercise. Lambs "skip," puppies and kittens frolic, and young human beings romp. This natural disposition to vigorous exercise can be freely indulged. It will promote sturdy and natural development of the body and its organs.

Provided the subject has no organic weakness, all ordinary school games and gymnastics are beneficial to the growing child of both sexes. There is no need for girls to take part in the rougher games, but a reasonable amount of hockey, lacrosse, tennis and basket-ball will strengthen and develop the feminine frame. But the exercise "par excellence" for adolescent girls is fencing. The practice of this art cultivates poise, precision, grace, and quickness of eye.

Eurhythmics, or free dancing in the Greek tradition, are generally performed out of doors in the lightest garb. They have a two-fold purpose and aim at developing mental poise as well as physical gracefulness through training the sense of rhythm.

In games and exercise the golden rule of moderation applies to young and old alike. A feeling of exhilaration should follow. Mild fatigue is permissible, but severe fatigue clearly shows that the exertion is too strenuous, and therefore, most harmful.

In young girls about the age of puberty, exercise should be regulated with especial care in view of the constitutional changes then in progress.

For the middle-aged of both sexes riding on horseback and golf are two ideal forms of exercise. Both take place out of doors, they involve many co-ordinated movements, and they can be carried out as vigorously or as quietly as desired. Unfortunately, they are not within the reach of us all.

Walking is a most useful exercise because it costs nothing, calls into play many important muscles, and can be graduated to suit the individual by regulating pace, route and distance. A gentle stroll on the level may afford ample exercise for a delicate person or a convalescent, while another can indulge in a long cross-country ramble. Few people, however, can spare the time to take all the exercise their bodies need in this somewhat leisurely form. Sensibly chosen clothing will greatly assist those who can. Stout, comfortable footwear; warm, but light and easy-fitting clothing are essential for any but a short stroll.

Dancing is another excellent form of mild exercise with the advantage that rhythm and balance are cultivated. It is, however, usually associated with a hot, close atmosphere, late hours, and loss of sleep. Its value is increased in the degree that these can be eliminated.

Swimming is a good and useful exercise for those with whom bathing agrees, but to benefit therefrom a healthy circulation is necessary. It induces deep breathing and so helps to develop and expand the chest.

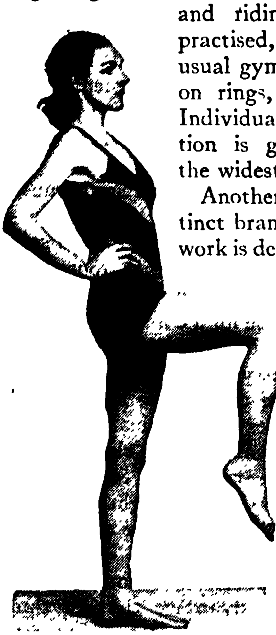
Football, like all team games, teaches self-control and the team spirit. It can be played with advantage between the ages of nine and thirty.

Tennis is one of the few more strenuous games which can be played until comparatively late in life. It gives splendid exercise and develops quickness of eye and accuracy of muscle control.

Badminton calls for even greater quickness of hand and eye and is an admirable way of getting plenty of exercise in a short time. This makes it particularly suitable for tropical climates, when some sharp exercise is needed in the brief cool spell just before nightfall.

In winter, especially, the gymnasium

provides a useful way of taking scientifically planned exercise under instruction. Free standing exercises, tactical marching, boxing, single-sticks, foils, mechanical rowing and riding, may all be practised, as well as the usual gymnastic evolutions on rings, horse, and bars. Individual or class instruction is given and covers the widest possible range.



Balance Exercise (first position). Hips firm, weight forward, knee raise

Another, but quite distinct branch of gymnasium work is devoted to *remedial*, as opposed to *preventive* exercise. This subject is dealt with elsewhere under the heading of GYMNASTICS—MEDICAL.

For those who have neither time nor opportunity for such activities, as well as for those who require more regular and systematic exercise, there remain the various forms of home or bedroom gymnastics, tabloid exercises, or "daily dozens." Many such systems are advertised in the weekly and monthly papers and magazines and range from simple exercises in free gymnastics designed to promote and maintain health, to advanced courses in physical culture aiming at great muscular development.

Time for Exercise.—Exercise should not be taken just after a meal. It has been shown above how exercise draws blood to the muscles in work. It therefore depletes other parts of the body, including the abdominal vessels which need a full blood supply during the earlier stages of digestion. Also, owing to their position in the body, a stomach distended by a full meal may press on the heart if the latter is put into increased activity by physical exercise.

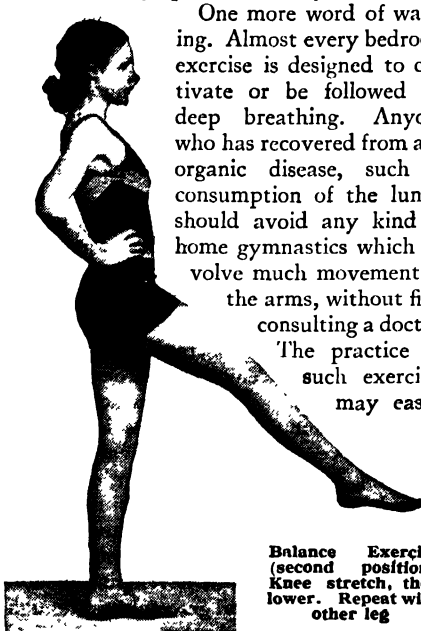
It also has been recently shown that strenuous exertion just before or after a meal lowers the normal acidity of the gastric secretions and affects the muscular action of the stomach wall, thus impairing digestion. On the other hand light exercise after an ordinary meal may tone up the stomach and stimulate its secretions.

It would therefore seem desirable to take the chief meal of the day after most of the day's work is done, and never to partake of a heavy meal immediately after a spell of hard or prolonged physical effort.

Particularly is it necessary to wait at least three-quarters of an hour after finishing a meal before bathing. To enter cold water—especially in a hot sun—shortly after a heavy meal is exceedingly dangerous.

It is also unwise to indulge in hard exercise when not in training. For example, if the occupation is a sedentary one, either the body must be kept in fair condition by daily exercise, or *strenuous* exercise at the week-end should be avoided. Similarly, it is unwise to plunge into hard exercise, such as mountaineering, at the very beginning of the annual holiday, unless some preliminary training has prepared the body.

One more word of warning. Almost every bedroom exercise is designed to cultivate or be followed by deep breathing. Anyone who has recovered from any organic disease, such as consumption of the lungs, should avoid any kind of home gymnastics which involve much movement of the arms, without first consulting a doctor. The practice of such exercises may easily break down the healed lung tissues and bring about a recurrence of the disease.



Balance Exercise (second position). Knee stretch, then lower. Repeat with other leg

Table of Home Exercises for a Busy Woman of Sedentary Occupation.

1. *Arm circling with deep breathing.*—Stand with feet together, head erect, hands

by the side and carry the arms forwards and upwards above the head. While doing so inhale deeply and look up. Lower the arms sideways while breathing out. Repeat 4 times.

2. *Trunk circling.*—Take a firm stand with the feet apart and hands on hips. Lean forward from the hips, keeping the back quite straight, and swing the trunk round in wide circles. Breathe in as the trunk moves round towards the rear and exhale as it comes forward. Perform the exercise four times in one direction and then repeat it circling the opposite way.

3. *Knee raising with leg stretching.*—Stand with the feet together and hands on hips. Count four. *One*, slowly bend up the right knee as far as it will come, keeping the toe pointed downwards; *two*, stretch the leg out forwards; *three*, bend it back again; *four*, lower to the ground. Do the same movements with the left leg and exercise each leg twice.



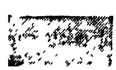
4. *Abdominal contractions with deep breathing.*—Lying on the back with the hands on hips and knees slightly drawn up, contract the abdominal muscles upwards and inwards at the same time inhaling deeply. Relax and breathe out. Four to 6 times.

5. *Trunk raising with arm stretching.*—Lie on the back with the hands on the hips and raise the body slowly to a good sitting position; then stretch the arms forward and touch the toes. Repeat 3 to 6 times.

6. *Trunk flinging.*—Sit on a stool or bench, hands on hips, and rotate the body quickly to either side. Repeat 8 times.

7. *Side bending with deep breathing.*—Sit with the hands clasped behind the head, elbows up and pressed well back. Bend the body over to the right while inhaling, raise it back again while exhaling. Repeat the exercise to the left and perform it 6 times in all.

8. *Arm raising with deep breathing.*—Stand and raise the arms slowly sideways to shoulder level at the same time raising the heels and breathing in. Lower the arms and heels while exhaling. Repeat 4 times.



Breathing Exercise. Heels raising, arms raising sideways, then lowering

Table of Home Exercises for a Busy Man of Sedentary Occupation.

1. *Arms bending and stretching.*—Stand at attention with the hands on the shoulders and vigorously bend and stretch the arms and fingers forwards, upwards, sideways, and downwards, twice or more in each direction.

2. *Knee bending with arm stretching and deep breathing.*—Stand with the hands on the shoulders, elbows down, and heels raised. Slowly bend the knees and at the same time stretch the arms above the head and breathe in deeply. Rise again slowly to tiptoe while lowering the arms and breathing out. Four times.

3. *Trunk bending forward and raising.*—Standing with the feet apart and arms above the head, bend the body forwards and downwards from the hips and place the hands on the ground. Keep the knees stiff and the head between the arms. Four times.

4. *With the body held horizontally arm bending and stretching.*—With the knees fully bent place the hands on the ground and extend both legs behind on to the toes with a spring. Keep the arms stiff and the body in a straight line from head to heel. Holding this position bend and straighten the elbows 4 to 10 times.

5. *Leg raising.*—Lie on the back with the hands clasped behind the head. Slowly raise each leg as high as possible, keeping the knee stiff. When proficient both legs may be raised together. Four to 8 times.

6. *Knee up-drawing with head raising.*—Lying on the back, the arms by the side, bend the knees up to the chest at the same time raising the head. Then give an extra pull-up to the knees with the arms. Four times.

7. *Abdominal contractions with deep breathing.*—Lying on the back with the knees slightly drawn up and the hands behind the head, contract the abdominal muscles upwards and inwards at the same time breathing in deeply. Relax and breathe out. Repeat this exercise 4 times.

8. *Trunk turning and bending.*—Stand with the feet apart and the arms stretched out sideways. Count four. *One*, turn the body smartly to the right; *two*, bend and touch the right foot with the left hand; *three*, rise, keeping the body still turned to the right; *four*, return to the front. Repeat the exercise to the left and perform it 2 to 4 times each way.

9. *Arm circling with deep breathing.*—Carry the arms forwards and upwards above the head, look up and inhale. Lower the arms sideways while breathing out. Four times.

Table of Home Exercises to correct a slight Dorsal Curve on the Right Side.

N.B. For a *left* dorsal curve proceed as follows substituting *left* for *right* and *vice versa*.

1. Sitting, place the left hand on the neck with the elbow well up and the right hand on the right hip. Bend the head backwards inhaling, raise it again breathing out. Four times.

2. From the same position bend the body forward keeping the back straight, and raise it again. Repeat 4 times.

3. From the same position turn the body to the left and back again to the front. Four times.

4. As above but with the right arm stretched down by the side fingers extended, endeavour to rotate the arm outwards from the shoulder-joint, keeping the arm straight and the armpit closed. At the same time inhale deeply and expand the chest. If the movement is correctly done the palm of the hand will turn outwards in a half-circle. Relax and exhale. Four times.

5. Sitting on the edge of a stool with the left arm stretched above the head, the right arm stretched down and to the rear and the right leg stretched out behind resting on the toes, lean the body forward until there is a straight line from the left hand to the right foot. Hold this position for half a minute, relax and repeat.

6. Lie on the back with the left arm stretched above the head and the right arm down by the side. Having placed a small hard cushion under the convexity on the right side, rest in this position.

Anæmia is poverty of blood. In addition to rest, good food, tonics, and plenty of fresh air, a general course of strengthening exercises which aid digestion, respiration, circulation and nutrition, are very beneficial. Over-fatigue, however, must be avoided. The patient should perform the exercises in the open air, or at least before an open window, and should rest for 15 to 30 minutes afterwards.

General Strengthening Exercises for a Patient with Anaemia.

1. Standing circle the arms forwards, upwards above the head, sideways, and downwards. Count four. *One and two*, raise the arms and inhale; *three and four*, lower the arms and breathe out. Four times.

2. Standing hands on hips, heels raising and knees bending to ground. Count four. *One*, heels raise; *two*, knees bend; *three*, rise to tiptoe; *four*, heels lower. Two times.

3. Take a firm stand with the feet apart and hands on hips. Lean forward from the hips, keeping the back hollow, and swing the trunk round in wide circles. Inhale as the trunk moves backwards, breathe out as it comes forward. Perform the exercise 4 times in each direction, 8 times in all.

4. Lying on the back with hands on hips, raise the legs alternately as high as possible. Four times.

5. From the same position draw up the knees alternately towards the chest. Four times.

6. From the same position raise the body to a sitting posture and reach forwards to touch the toes. Four times.

7. Lying face downwards, hands on hips, raise the head and shoulders. Four times.

8. Standing on the toes, hands on hips, jump the feet apart and together again lightly, counting 1, 2, 1, 2, . . . *ad lib.*

9. Stand with the arms by the sides and count four. *One and two*, rise on the toes and raise the arms sideways to shoulder level inhaling; *three and four*, lower the arms and heels while breathing out. Four times.

10. Stand with the feet apart and arms stretched out sideways at shoulder level. Count four. *One*, turn the body smartly to the right; *two*, bend and touch the right foot with the left hand; *three*, rise, keeping the body still turned to the right; *four*, turn to the front. Repeat the exercise to the left side. In all 4 times.

11. Repeat Exercise No. 1.

N.B. To avoid fatigue the patient should begin with a few of these exercises and work up the number gradually to the full table.

Fatty Infiltration of the Heart.—In many disorders of the heart exercises are undesirable. They are, however, frequently ordered in cases of fatty infiltration. In this condition the heart lacks tone and muscularity on account of the deposits of superfluous fat round the organ. The object of the exercises is to break up and remove this fatty tissue and by aiding the circulation of blood in the veins to ease the work of the heart and improve its muscular tone.

The patient lies down with shoulders raised, if possible in front of an open window.

1. With the right hand make rhythmical soothing stroking movements in circles over the region of the heart. Continue for 2 to 4 minutes, pressing gently with the ball of the thumb.

2. Take four long deep breaths.

3. Slowly curl up the toes as far as possible underneath the foot and slowly uncurl them again. Four times.

4. Slowly straighten out the ankles, then bend them back again as far as possible. Four times.

5. Slowly and rhythmically circle the feet from the ankles first outwards, then inwards. Four times in each direction.

6. Raise the legs alternately as high as possible. At first some outside help may be needed to take the weight of the leg, but this can be dispensed with later. Two to 4 times.

7. Gently draw up the knees one leg at a time, the assistant taking the weight of the legs. Twice each leg.

8. Repeat Exercises 1 and 2.

9. Clench the fists slowly and extend the fingers fully. Four times.

10. Slowly bend the wrists backwards and forwards as far as possible. Four times.

11. Circle the wrists slowly and rhythmically 4 times in each direction.

12. Bend and extend the elbows 4 times.

13. Raise both arms sideways to shoulder level, breathing in deeply while raising, exhaling while lowering. Four times.

14. Repeat Exercises 1 and 2.

Precautions.—Do not cause fatigue. Take the patient's pulse before and after treatment. At any change of colour, restlessness, sighing, yawning, or cold sweat, stop the treatment at once.

Locomotor Ataxia.—This is a disease of the nervous system. There is loss of muscle co-ordination and movements of the limbs become uncertain and exaggerated. The sense of balance is diminished, especially when the eyes are shut, and as the case advances there is difficulty in standing and walking.

Remedial exercises play an important part in the treatment and by their means the progress of the disease may be temporarily or permanently arrested. They are of a re-educative nature and the patient should, therefore, concentrate his attention upon and closely watch every movement of his muscles.

The patient lies on the back with the shoulders slightly raised.—1. Slowly and rhythmically draw up the knee while keeping the heel in contact with the bed.

2. Slightly raise the leg and carry it out sideways and back again.

3. Raise the leg keeping the knee stiff.

4. Place the heel of one leg on the knee or ankle of the other.

5. Touch different objects with either foot.

Sitting.—1. The patient is placed in and tries to hold the fundamental sitting position, viz. with the thighs supported along their whole length, hip, knee and ankle joints at right angles, the feet supported on the floor or otherwise, the legs slightly apart, the head and body erect, and the arms hanging by the sides.

2. The patient attempts to rise and sit down again. He should draw back the feet until the heels are in a line with or slightly behind the front legs of the chair. He then bends forwards and straightens the knees and body at the same time.

3. The patient raises each knee alternately and places the foot firmly upon a traced cardboard footprint, which the attendant moves to different positions.

4. The patient practises placing his finger upon any particular square of a numbered board as commanded.

5. The patient piles up small discs or coins.

Standing.

1. WALKING.—(*a*) The patient walks slowly forwards for 20 yards, closely watching every movement and trying to control lateral wandering.

(*b*) As above but following a narrow base

(*c*) As in (*a*) but (i) taking medium paces.
(ii) „ small „
(iii) „ long „

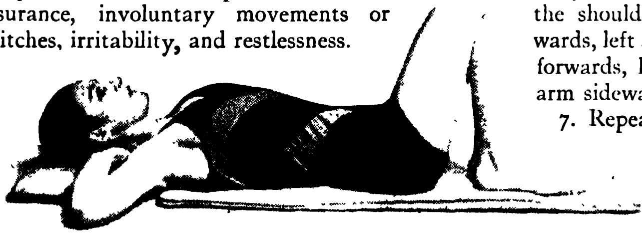
(*d*) As in (*a*) each leg taking alternate long and short paces.

(*e*) Variations in walking, walking backwards, sideways, zig-zag, upstairs, downstairs, with arms raised, etc.

(*f*) When proficient any of the above may be attempted with the eyes closed in order further to develop the new sense.

Precautions.—Patients, though themselves unaware of it, are easily tired. The exercises must, therefore, be very carefully graduated and the pulse taken frequently. Its rate is the only reliable guide to the degree of fatigue caused by the exercises. The attendant must always be close at hand in case the patient loses balance. Should he do so, support is given under the armpits, not to the arms or hands.

St. Vitus's Dance (Chorea).—The usual symptoms of this complaint are loss of assurance, involuntary movements or twitches, irritability, and restlessness.



Kyphosis (Round Back) Exercise. Hands neck rest, stretching muscles and deep breathing

Special remedial exercises are designed to teach co-ordination of muscles. They require attention and precision for their correct performance and should be methodically carried out in front of a mirror.

In addition to the exercises the patient should try to keep quite still for gradually lengthening periods timed by the clock.

Exercise.—All movements are to be done slowly and rhythmically.

1. Arm circling forwards, upwards, sideways, and downwards, with deep breathing. Count four. *One* and *two*, arms forwards and upwards, breathing in; *three* and *four*, sideways and downwards, breathing out. Four times.

2. Stand with the hands on the hips and raise the knees alternately, counting four. *One*, raise right knee to the horizontal, keeping the thigh and leg at right angles; *two*, stretch the leg forwards; *three*, return to position one; lower the leg to the ground. Repeat with the left leg and do the exercise in all 4 times. (N.B. Do not jerk this movement.)

3. Stand with the hands on the hips and count four. *One*, raise the heels; *two*, bend the knees outwards and sink; *three*, rise again to position one; *four*, lower the heels. Later on elaborate this exercise by raising the arms sideways on *one*, and lowering them on *four*.

4. Lie on the back and swing one leg at a time round in a fairly large circle. Later on circle both legs at the same time.

5. Standing with the arms extended sideways, lean the body forwards and raise the left leg up backwards until nearly horizontal, letting the right knee bend slightly. Hold the position, then recover and repeat on the left leg.

6. To be done in front of a mirror. Bend and stretch the arms simultaneously, but in different directions from the shoulder. e.g. Right arm upwards, left arm sideways; right arm forwards, left arm upwards; right arm sideways, left arm downwards.

7. Repeat Exercise No. 1.

Round Back (Kyphosis).—In this condition the muscles and ligaments of the back are weak and stretched, while those of the front shorten. This produces a rounded, bent back, with hollow, narrow chest, and affects both respiration and circulation through pressure on the lungs and heart.

The principal causes of kyphosis are:

(*a*) Weakness of the muscles of the back due to general debility, overgrowth, or fatigue.

(*b*) Defective eyesight leading to habitual stooping and peering.

(*c*) Prolonged studying or office work in a forward leaning attitude.

(*d*) In growing children faulty clothing, badly fitting or too tight, interfering with a correct carriage.

After removing the cause remedial gymnastics will be of great benefit in expanding the chest and strengthening the weak back muscles and ligaments. The deformity can thus be corrected and the health of the patient improved as well.

In addition to the exercises, lying on the

back on some hard surface with no pillow for one hour daily is restful and effective.

Exercise.

1. Standing with the arms raised forwards to shoulder level, part the arms sideways and backwards while breathing deeply. Inhale as the arms go back, exhale as they come forwards again. Four times.

2. Lying face downwards with hands on hips and feet fixed, raise the head and shoulders as high as possible. Four times.

3. Lying on the back with the knees drawn up and the hands clasped behind the neck, inhale and exhale deeply. Four times.

4. Lying on the back count four. *One*, raise a knee; *two*, straighten the leg; *three*, flex the knee again; *four*, lower the leg. Repeat with the other leg. Each leg twice.

5. Lying on the back with the feet fixed and the hands on the hips, raise the body to a sitting position and lower again. Three times.

6. Lying on the back with the knees drawn up and the hands clasped behind the head, contract the abdominal muscles while inhaling. Relax and breathe out. Four times.

7. Stand one foot (1 ft.) away from and facing a wall. Place the hands, finger-tips touching, against the wall at shoulder level. Fall forward from the feet, raising the heels, until the chest touches the wall. Four times.

8. Standing close to and facing a wall, stretch the arms up the wall as far as possible. In this position bend the head backwards and raise it again. Four times.

9. Standing in front of a mirror, assume a correct position of the head, chest, and shoulders. With hands on hips count four. *One*, raise the heels; *two*, bend the knees slightly; *three*, straighten the knees; *four*, lower the heels. This is a balance exercise and it is intended that the patient shall hold the correct posture which has been assumed, while performing the gymnastic movements. At first it may only be possible to sink a little way as the knees bend, but this will improve with practice.

10. Repeat Exercise No. 3.

Hollow Back (Lordosis).—In this condition there is an increase of the normal forward curve of the spine in the region of the small of the back. The muscles and ligaments of the front of the spine become stretched, while those at the back of the spine in this region become shortened.

Common causes of Lordosis are:

1. High-heeled shoes, because they tend to throw the centre of gravity forward.
2. Weakness of the abdominal muscles.
3. Habitually incorrect posture.
4. Over-correction for round shoulders, if care is not taken.

Remedial gymnastic treatment consists of teaching the patient a correct posture and of exercises to contract and strengthen the muscles and ligaments in front of the spine and to stretch those behind it.

Table of Home Exercises for Lordosis.

1. Sit on the floor or a bench with the knees drawn right up. Clasp the arms round them and hold this position for 3 to 5 minutes.

2. Standing with the feet apart and arms above the head, bend the body down to the ground (keeping the head between the arms) and touch the toes without bending the knees. Four times.

3. Lying on the back draw up both knees to the chest. Four times.

4. Lying on the back raise the body to a sitting position. Touch the right foot with the left hand, then the left foot with the right hand, then both feet with both hands. Twice.

5. Sitting on the floor with the hands on the hips, bend the head backwards and breathe in deeply. Four times.

6. Standing with the back to and about 1 ft. away from a post or door-frame, lean back against it and then bend forwards bunching the back. Slowly rise again keeping the spine in contact with the post all the way up. As the condition improves this exercise can be made more difficult by starting with the feet nearer to the post and to each other.

7. Lying on the back with the knees drawn up, contract the abdominal muscles while inhaling deeply. Relax and breathe out. Four times.

8. Repeat Exercise No. 1.

Habitual or Chronic Constipation.—Constipation exists if there is not a normal evacuation of the bowels at least once daily. Such a condition is detrimental to health and should not be neglected. It may as a rule be successfully treated by systematically carrying out the following simple home exercises specially designed to tone up the abdominal muscles and intestines.

Throughout the exercises the breathing should be as full and deep as possible because of the massage effects of deep breathing upon the liver and other internal organs.

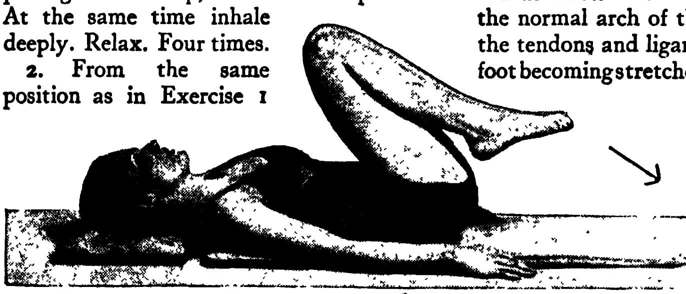
Attention must also be paid to the diet. The patient should drink plenty of water and avoid an excess of such constipating foods as meat and fats. Instead he should take plenty of fruit, vegetables, and coarse, brown bread.

The beginner is advised not to attempt all the exercises a full number of times, but to work up gradually to a full performance.

Table.

1. Lying on the back with the knees drawn up, contract the abdominal muscles by pulling the knees up, and in as far as possible. At the same time inhale deeply. Relax. Four times.

2. From the same position as in Exercise 1 raise the pelvis until shoulders, hips, and knees are in line, inhaling deeply while doing so. Relax and breathe out. Four times.



Constipation Exercise. Double leg up, drawing muscles and lowering contracting abdominal

3. From the same position raise the hips as before and swing the pelvis from side to side in short, quick movements.

4. Lying on the back with hands on hips, draw up one knee as far as possible. Give an extra pull on it with the hands to press the thigh against the abdomen. Repeat with the other knee. In all 4 times.

5. From the same position as in Exercise 4 raise the body to a sitting posture and touch the toes with the fingers. Two times.

6. From the same position raise the right leg as high as possible, lower and raise the left, lower and raise both. Twice.

7. Still from the same position raise the head and draw up the right hip, making the right leg shorter than the other. Repeat with the left hip and leg. Four times.

8. Repeat Exercise No. 1.

9. Stand with hands on hips and raise each knee alternately, pausing and holding the position for five seconds. Two times.

10. Take a firm stand with hands on hips and feet apart. Keeping the back straight, lean forwards from the hips and circle the trunk four times to the right and four times to the left. Inhale as the trunk moves backwards, exhale as it comes forward. Eight times.

11. Stand with the feet apart and the arms stretched out sideways. Count four. *One*, turn the body smartly to the right; *two*, bend and touch the right foot with the left hand; *three*, rise, keeping the body still turned to the right; *four*, return to the front. Repeat the exercise to the left and perform it 2 to 4 times each way.

12. Repeat Exercise No. 1.

Flat Foot.—In this unsightly deformity the normal arch of the foot drops owing to the tendons and ligaments of the sole of the foot becoming stretched. The bony structures on account of pressure, and the ligaments on account of strain, are liable to become inflamed. There is then aching and tenderness along the sole of the foot and up the back of the leg. The patient loses all spring and elasticity of gait, the foot turns out, and he is inclined to waddle.

The causes of this condition are:

(*a*) Constitutional, such as the rapid increase of weight in obesity.

(*b*) Occupational. Prolonged standing, walking, or weight-lifting of waiters, postmen, or porters.

(*c*) The wearing of high-heeled shoes, which artificially increases the arch of the foot.

Try to remove the cause and perform these exercises to strengthen the fallen arches and over-stretched tendons.

The patient should wear loose-fitting clothes and either rubber-soled shoes without heels or no footwear. The muscles should be relaxed and rested between each exercise.

1. Stand at attention with the arms down by the sides, fingers extended, feet close together heels and toes touching. Raise the arms sideways to shoulder level at the same time raising the heels and taking a deep

breath. Count four. *One* and *two*, raise and inhale; *three* and *four*, lower and exhale.

2. Stand with hands on hips, feet together, toes touching. Raise each knee alternately till the thigh is horizontal, keeping the knee bent at right angles and the toe pointing down. Count four. *One*, raise; *two*, hold; *three*, lower; *four*, pause. Eight to 10 times.



Flat Foot Exercise. Alternate knee raising and lowering, keeping the standing foot arched and curling down the toes of the raised foot

3. From the same position walk across the room on a straight line, keeping toes and heels on the line.

4. Sitting on a chair with the feet together on the ground, practise curling up the toes underneath the feet thus pulling up the fallen arches. Count, 1, 2, 1, 2, . . . Twenty times.

5. Sitting on a chair raise one leg a few inches off the ground. With the foot well drawn back count three. *One*, straighten out the foot; *two*, turn the foot inwards; *three*, draw the foot back and up again. Do this ten times with each foot separately. Later they can be exercised simultaneously.

6. With hands on hips stand on tiptoe and spring the feet lightly apart and back quickly counting 1, 2, 1, 2, . . . Twenty times.

7. Stand with hands on hips, toes and heels together. Count four. *One*, raise the heels *two*, bend the knees and sink as low as possible; *three*, straighten the knees again; *four*, lower the heels. Four times.

8. Repeat Exercise No. 1.

Obesity.—In most cases suitable exercises will do much to relieve this condition.

1. *Arms bending and stretching.*—Standing with the hands on the shoulders and elbows down, vigorously bend and stretch the arms and fingers forwards, upwards, sideways, and downwards twice in each direction.

2. *Leg swinging.*—With one hand holding a chair-back, bedpost, or other support, swing one leg shortly and sharply to and fro keeping the knee straight and the foot bent up. Turn round and swing the other leg. Twelve double swings with each leg.

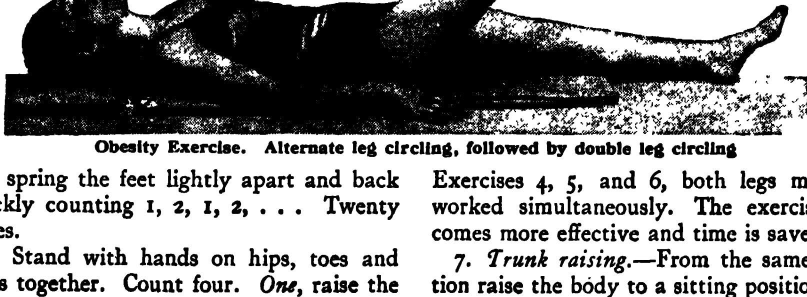
3. *Arms raising with deep breathing.*—Standing at attention raise the arms sideways to shoulder level while breathing in. Lower the arms and exhale. Six times.

4. *Knee up-drawing.*—Lying on the back, the arms by the sides, bend up the knees alternately to the chest and down again. Each leg 6 times.

5. *Leg sideways carrying.*—From the same position raise one leg slightly and carry it out sideways as far as possible and back again. Lower and repeat the exercise with the other leg. Each leg 6 times.

6. *Leg circling.*—Lying on the back, hands by the sides, raise the right leg and swing it round slowly in a fairly large circle 6 times. Repeat the exercises with the left leg. Now raise the right leg again and circle it in the opposite direction; repeat with the left leg. Each leg 12 times.

N.B. When proficient in Exercises 4, 5, and 6, both legs may be worked simultaneously. The exercise becomes more effective and time is saved.



Obesity Exercise. Alternate leg circling, followed by double leg circling

7. *Trunk raising.*—From the same position raise the body to a sitting position and leaning forwards try to touch the toes. This

exercise is easier if the feet are fixed. Six times.

8. *Body forwards bending and raising.*—Sit on a stool with the hands on the hips and slowly lean the body forward as far as possible. Slowly raise again. Four times.

9. *Trunk sideways flinging.*—From the same position turn the body from side to side in a quick flinging movement. Continue *ad lib.*

10. *Elbow circling.*—Still seated raise the elbows to shoulder level with the fists closed and forearms fully flexed. Vigorously describe small circles with the elbows from front to back. Ten to 20 times.

11. *Head bending and turning with breathing.*—Still seated, with hands on hips. (*a*) Bend the head fully backwards while inhaling. Raise the head and breathe out. (*b*) Turn the head first right, then left, inhaling while turning and exhaling while straightening. (*c*) Roll the head over, first right then left. Each movement twice each way.

12. *Arms raising with deep breathing.*—Standing inhale while raising the arms sideways and rising on the heels. Count four. *One* and *two,* while rising; *three* and *four*, while lowering. Six times.

Wry Neck, Stiff Neck (Torticollis).—Acquired torticollis due to rheumatism or caused by a draught may be greatly relieved by massage and home exercises.

The following exercises are for a stiff neck on the right side. If the trouble is on the other side, read *left* for *right,* and vice versa.

1. Sitting with the hands fixed on the seat of the chair, slowly roll the head from side to side, beginning with a small movement and gradually increasing this as the muscles relax.

2. Bend the head over towards the left shoulder and try to keep it there with the neck muscles, while the right hand, placed over the top of the head, tries to pull it back.

3. Bend the head over as in the preceding exercise, but this time oppose the bending over with the left hand.

4. Turn the head as far as possible to the right and try to keep it there while the left hand pulls it back.

5. Turn the head as in the preceding exercise, but oppose the rotation with the left hand.

6. Repeat Exercise No. 1.

N.B. Take these movements just to hurting point, but no further. Never strain.

Enlarged Tonsils, Adenoids.—This condition tends to pass as the child grows older, but if persistent, an operation will have to be performed.

Gymnastics which include many breathing exercises benefit the general health as well as developing the chest. After operation they are especially valuable to prevent a recurrence of trouble and to teach the patient to breathe freely through the nose.

Table of Exercises for Tonsils and Adenoids.—To be performed in the open air or in front of an open window. The patient tries to keep the mouth shut and breath in and out through the nose.

1. Standing holding the mouth shut with two fingers, breathe deeply in and out four times.

2. Standing with feet apart and hands on hips, turn the head alternately to the right and left while taking deep breaths. Count four. *One*, turn head to right and breathe in; *two*, turn head forwards again exhaling; *three*, turn left breathing in; *four*, turn forward again breathing out. Four times.

3. Standing with feet apart and hands on hips, lean forwards slightly from the hips and make large circles with the trunk. Keep the back hollowed and circle 4 times in each direction. Inhale while the trunk moves backwards, exhale as it comes forward again.

4. Standing with the arms raised forwards to shoulder level, part the arms sideways. Count four. *One*, arms sideways breathe in; *two*, hold; *three*, arms forward breathe out; *four*, hold. Four times.

5. Standing circle the arms forwards and upwards above the head, sideways and downwards. Count four. *One* and *two,* raise the arms while breathing in; *three* and *four*, lower the arms and breathe out. Four times.

6. Standing with the hands on the hips count four. *One*, raise the heels; *two*, bend the knees outwards and sink; *three*, rise again to the first position; *four*, lower the heels. Four times.

7. Standing on the toes with the hands on the hips, jump the feet apart and together again, lightly and quickly, counting 1, 2, 1, 2. *ad lib.*

8. Stand with the arms by the sides and count four. *One* and *two,* rise on toes and raise arms sideways to shoulder level, while breathing in; *three* and *four*, lower arms and heels while breathing out. Repeat four times.